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Nothing is certain in life except death and taxes, and since the world didn’t end on December 21, 2012, as some had interpreted the Mayan calendar, that meant the United States (US) Congress had to deal with taxes.

Oh, the agony of listening, day after day, about the “fiscal cliff” and whether this nation should jump or not. Some said, “let’s go” while others fiercely warned of another economic recession if we did. Yet, not long after the midnight hour of the first day of 2013, Congress did pass a huge 154-page bill without reading all the details. Yes, the government raised taxes on what some call high income earners (everybody has an opinion), along with all wage earners, about 77 percent of Americans, in the form of higher payroll taxes by allowing the payroll tax holiday to expire.

What didn’t get a lot of mainstream media attention are the billions of dollars in tax relief to a multitude of businesses and special interest groups. Keep in mind these weren’t new tax credits, but extensions of those that had already expired or were due to end in 2012. While some are provided to assist farmers, low-income communities, and developing industries such as biofuels, a few of the tax credits extended seem downright generous. For instance, $248 million in tax credits for film production expenses (yes, the government is subsidizing Hollywood), $222 million in tax credits for rum production in Puerto Rico and the US Virgin Islands (more daiquiris for all), and an extension of a seven-year cost recovery period for NASCAR-type racing complexes at a cost of $70 million.

So, who were the big tax credit winners? Per the Joint Committee on Taxation, $14.3 billion to subsidize business research and development (nothing more specific than that), $12.1 billion for a wind production tax credit (a “temporary” program put in place in 1992), and $5 billion in direct payments to farmers (some public policy groups say most are large corporations).

Yet the agony isn’t over as Congress must now go to bat on how to deal with this country’s ever-rising debt crisis. Gee, wonder how that happened?
Congress Up to Its Neck in Challenges

The holiday foofarah over negotiations among the two chambers of Congress and the White House on how to avoid the “fiscal cliff” was far more light than heat. What was achieved was a series of rather minor adjustments to the tax code and a highly unpopular extension of the 2008 farm bill just to keep the United States Department of Agriculture (USDA) running and milk prices low for the time being. Given the media hysteria and the hype-up political rhetoric, one would have thought that as a nation we’d abandoned all hope. Not so much; ultimately, negotiators slapped a political bandage on the whole mess, or to use the newest Washington jargon: They kicked it down the road.

Now comes the heavy lifting.

The American Taxpayer Relief Act – a misnomer if there ever was one – is now the law of the land. The two percent reduction in payroll taxes is no more; the personal tax rate for those making over $400,000 per person, $450,000 per couple is now 39.6 percent, along with a new 20 percent capital gains and dividend tax on those higher wage earners. The estate tax is now 40 percent, but doesn’t kick in unless your estate is worth over $5 million. Once again the federal bioenergy blender’s tax credit for biodiesel/renewable diesel is extended, retroactive to January 1, 2012, along with several minor biofuels tax “gimmies.” USDA’s authority over farm programs is restored for nine months, but all of the “must-spend” language is gone from most programs so the spending/savings monkey is on the back of USDA Secretary Tom Vilsack. The Market Access Program (MAP) and Foreign Market Development (FMD) money is restored, and consumer milk prices will not double overnight as the media warned. Nothing was done to ease the corporate tax rate.

The reality is most of this will change by the end of 2013. There’s nothing permanent about anything in federal law; laws are amended, they’re repealed, courts overturn them, or they’re replaced by new laws. What Congress and the White House did was slap together a very temporary, very sloppy politically motivated fix to get themselves off the year-end hook, thus avoiding all of the dire predictions of economic disaster we had hurled ourselves off the fiscal cliff. All of the political speculation over whether President Barack Obama or House Speaker John Boehner won is pointless; what we – and they – suffered through during the last several weeks of 2012 was just the first skirmish in what promises to be a very long war.

The next battle will be the debt ceiling, spiced up by congressional efforts to cut spending by over $1 trillion in the next 10 years. Under US law, the government can’t spend more money than it takes in or can borrow. Back during World War I, Congress limited how much Congress could borrow in any given fiscal year, and given the government consistently spends more than it takes in, that ceiling has been increased dozens of times over the last 100 years. Folks heard a lot about the debt ceiling in 2011 during the political tug-of-war over deficit reduction. Again, at the eleventh hour, Congress and the White House came to an agreement embodied in the Budget Control Act of 2011 – another misnomer – and despite raising the debt ceiling to $2.4 trillion in exchange for “future” spending cuts, Standard and Poor’s downgraded the credit worthiness of federal bonds for the first time in this country’s history. The US Treasury hit its borrowing limit on December 31, 2012; the government is operating on a 60-day window with stop-gap measures.

The issue is the government’s ability to pay or incur greater debt. Congress and the Obama administration are confronted with either increasing the debt limit of the US Treasury or cutting spending. This administration is loath to cut spending so, of course, the White House wants the debt ceiling raised. In a January 7, 2013, Wall Street Journal interview with Boehner, the Speaker explains Obama doesn’t believe there’s a government spending problem, but rather a “healthcare problem,” meaning fixes to the federal healthcare system will save money and solve the federal deficit issue over time. However, despite Obama’s rosy assertion, fiscal conservatives from both sides of Capitol Hill and both sides of the aisle want to see commitments on spending cuts — including reinvention of Medicare, Medicaid, and Social Security — before the debt ceiling is even discussed. Hence, mandatory spending cuts contained in the Budget Control Act of 2011 were extended for only two months in hopes that $1.2 trillion in cuts over 10 years can be found and enacted. This would, it is hoped, make the debt ceiling debate moot. Every congressional committee is now charged with finding cuts and spending adjustments within their areas of jurisdiction to make this all happen.

The next battle will be tax reform — given “success” on the debt ceiling/spending fights — and both the House Ways and Means Committee under the leadership of Representative Dave Camp (R-MI) and the Senate Finance Committee steered by fiscal moderate Senator Max Baucus (D-MT) have quietly been working to come up with their portion of the spending/deficit reduction “grand bargain.” Both Camp and Baucus want a soup-to-nuts overhaul of the federal tax system, not only reinventing both personal and corporate tax rates, but an elimination of special interest loop holes, credits, and other benefits.

The secondary front in this war will be a comprehensive rewrite of existing USDA program authority, i.e., a 2013 farm bill. The extension of department authority runs only through the end of September, and both House and Senate Agriculture Committee chairs have already begun the process of setting up last year’s Senate-approved ag bill and the House ag panel’s passed bill for committee action in this, the 113th Congress.
It’s hoped the ugliest of the farm bill battles can be avoided since both panels are now painfully aware of the economic and political shortcomings of their respective legislation.

At the eleventh hour during the fiscal cliff negotiations, House Agriculture Committee Chairman Frank Lucas (R-OK) and Senate Agriculture Committee Chairman Debbie Stabenow (D-MI) produced an extension bill that was submitted to congressional fiscal cliff negotiators for inclusion in the final cliff deal. Unfortunately, the bill was so loaded with new programs it would have inspired several Senate procedural challenges, so the extension language was rejected. It also didn’t help much that Boehner waded into the fray, rejecting the package outright as impassable in the House.

Not counting gun control, immigration reform, energy, and a host of other priority issues, Congress is going to be up to its neck in challenges: debt ceiling, $1.2 trillion in spending cuts, comprehensive federal tax reform, and a 2013 farm bill. It’s going to be a busy, busy year.
Hope Dawns for Aging Feed Mill

There’s a time warp at the University of California (UC), Davis, feedlot.

It’s the twenty-first century on most of the 50 acres of pastures and pens two miles west of the main campus, where renowned scientists produce ground-breaking research on animal welfare, livestock production, and environmental quality. For example, this is where you will find the multimillion dollar environmental chambers and bovine bubbles where UC Davis Professor and UC Cooperative Extension specialist Frank Mitloehner and his team work to minimize unwanted nutrient losses by animals – which affect water and air quality – and increase those nutrient values in products humans consume.

It’s also where you’ll find one of the most antiquated feed mills around. Built in 1960, the rusty UC Davis feed mill is better suited for a museum than preparing the precise mixtures of grain and additives needed to conduct world-class science and educate a new generation of agricultural leaders.

“That mill is badly outdated,” said John Pereira, managing partner with Frontier Ag, a merchandiser of agricultural and feed commodities based in the Sacramento Valley. “UC Davis has a top-rate animal science program that’s making a huge difference in our industry, keeping agriculture productive and sustainable. They absolutely need a new feed mill.”

Leaders from the industry are working to make that happen. Pereira is president of the California Grain and Feed Association (CGFA), which recently started the effort and donated $150,000 towards building a new UC Davis feed mill – $100,000 now and $50,000 once construction begins in early fall 2013.

“It’s our way of supporting the work UC Davis and Frank Mitloehner are doing, which is some of the world’s finest research,” Pereira remarked.

Mitloehner was recently selected to chair a United Nations Food and Agriculture Organization committee to measure and assess the environmental impacts of the global livestock industry. The international effort is the first step toward improving the sustainability of the livestock sector, particularly as the global consumption of meat, dairy products, and eggs continues to rise.

As chair of the new committee, Mitloehner will lead representatives of national governments, livestock industries, and nonprofit and private sectors in establishing science-based methods to quantify livestock’s carbon footprint, create a database of greenhouse gas emission factors for animal feed, and develop a methodology to measure other environmental pressures, such as water consumption and nutrient loss.

“A new feed mill will really help that effort,” Mitloehner stated. “We very much appreciate the California Grain and Feed Association’s contributions. We’re also reaching out to conservation groups and other stakeholders, because quantifying livestock’s environmental footprint is important to us all.”

The new feed mill will cost $5.3 million — $2 million of that from in-kind equipment donations already pledged from industry and $3.3 million in monetary donations. The UC Davis College of Agricultural and Environmental Sciences contributed $100,000.

“All the preliminary work has been done,” noted Dan Sehnert, animal facilities coordinator for the UC Davis Department of Animal Science. “With the help of an industry planning committee, we have a site map, an approved environmental impact report, and everything else we need to get started once we have the funds.”

UC Davis animal scientists are awarded millions of dollars in grant funding, but that money can’t be used to support infrastructure, like a new feed mill. The current feed mill was a gift from the California Cattle Feeders Association in 1961.

“It was state-of-the-art at the time,” said Mitloehner. “And it has served us well. But now, it is totally outdated.” The tarnished feed mill has had its pieces patched and repatched where maintenance crews struggle to keep the equipment running. Couldn’t UC Davis contract with commercial mills to meet its animal feed needs?

“No, because researchers are doing a lot more than keeping the animals [cattle, swine, goats, sheep, horses, poultry, and others] alive and well,” explained Sehnert. “They carefully control and monitor what goes in and comes out of the animals, testing for things such as feed efficiency.”

“For example, we integrate additives into feed to reduce the nitrogen that leaves the cow,” added Mitloehner. “We work with very small amounts of additives, which need to circulate thoroughly throughout the feed. Much of our research depends on the ability to customize feed.”

Mitloehner and his team also measure the methane in a cow’s exhale, using machines they built that exist nowhere else in the world. Two at a time, the cows breathe into a clear, plastic box that captures their breath.
“What is the carbon footprint of a gallon of milk?” Mitloehner asks. “Our research will help answer that question. We need good data to understand the true impact of agriculture on the environment.”

Industry and society depend on the data UC Davis is producing, according to Ken Zeman, feed mill superintendent at Harris Feeding Company and chair of the industry planning committee that supports a new UC Davis feed mill.

“Dr. Mitloehner is one of a kind,” Zeman stated from his office at Harris Ranch outside Coalinga, CA. “His program is providing good, reliable information. His research is recognized worldwide, and his students are going on to become leaders in our industry. We need to do all we can to support that program.”

There are 1,000 undergraduates and 100 graduate students in the UC Davis Department of Animal Science. One of those graduate students is Clayton Neumeier, who prepares feed in a cement mixer outside the methane-measuring pens.

“Yeah, it’s pretty low tech,” Neumeier commented with a smile.

UC Davis animal scientists deserve better, said Chris Zanobini, chief executive officer for the CGFA.

“I’m thrilled our association has made the first industry gift, because when you have a program that good, you want to do all we can to support it,” he noted. “I know others will join us, because the work Mitloehner is doing with air quality – along with all the work in the animal science department – is important to our operations. It’s vital to our future, not just for our industry, but for our state, our nation, and our world.”

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Catching Grease Thieves

By Tina Caparella

It’s all about relationships. Well, and catching thieves. For the past four years, Baker Commodities has been forging relationships, trailering trucks, and making solid cases against those who are stealing used cooking grease in Las Vegas, NV.

A long-time area resident who was working in security at MGM Resorts International’s The Mirage Hotel and Casino was hired by Baker as an investigator to help put a stop to grease theft. The first thing he did was establish relationships with all area renderers and the three local police agencies. Another crucial connection he forged was with the Southern Nevada Health District’s Solid Waste and Compliance Section, the agency that governs state laws as they relate to registration, transportation, and disposal of used cooking grease.

These relationships, and the immeasurable support Baker’s investigators across the United States receive from the Los Angeles, CA-based renderer, have resulted in Baker’s Las Vegas Division obtaining 37 convictions over the past two-and-a-half years, with a number of those resulting in felonies.

“We document everything, that way we have a solid case,” Baker’s investigator noted. Helping to document the thefts are video recording equipment in vehicles and onsite at restaurants, laptops to access wireless cameras and transporter databases, and other equipment provided by Baker Commodities so investigators have solid evidence against thieves. The renderer builds its cases with the goal of getting a felony grand larceny conviction, which in Nevada must exceed $750 in damages. Such costs included are loss of product, damage to equipment, an investigator’s time, and the cost to send a driver out to repair or collect and replace a damaged grease container. Baker also pushes to have the grease collection vehicles involved in illegal activities impounded. Fines are set by statute and can be as high as $5,000 per violation for first offenders.

Over the years, Baker Commodities and many other renderers and grease collectors who have discovered empty grease tanks upon arrival have modified containers with steel lids, locks, finer mesh screens, and other mechanisms in an effort to protect the valuable commodity inside. Yet, thefts continue. State and local laws have also been put in place to help curtail robberies. In the state of Nevada, a permit is required from the Solid Waste Management Authority to transport used cooking grease or establish a disposal or collection facility. A permit can be revoked if activities outside a permit condition continue, which includes stealing or accepting stolen grease. Currently, there are registered companies both in- and out-of-state that have previous violations for stealing and accepting stolen grease.

It took some effort to get the Clark County Solid Waste and Compliance Section and law enforcement interested in going after grease thieves. Baker’s investigator would follow vehicles stealing cooking grease, document the theft and the location of often unpermitted collection yards accepting the stolen material, then file reports with the department. After seeing the magnitude of the problem, including state and local costs when illegal grease activities result in spills or improper disposal in drains or rivers and streams, and the potential revenue the department could obtain from fines, all hands were onboard.

“It’s against the law,” reiterated Gerald Bletsch of the Permitted Disposal Facilities Program within Southern Nevada’s Solid Waste and Compliance Section, which has administrative hearing officers who preside over unsettled cases and set fines. Bletsch believes there are sufficient regulatory tools in place to continue the department’s successful crackdown on grease theft; however, when one operation is shut down, oftentimes another one emerges, making the fight a continual one.

Another approach Baker is taking is the installation of indoor grease collection tanks for its accounts. Much smaller than the traditional large outdoor containers, drivers must now visit the restaurant more often to collect the used grease, but it also means the grease is there upon arrival.

Since Baker began focusing more on the fight against grease theft, there has been a 60 percent reduction in grease thefts in the Las Vegas area, which includes the nearby city of Henderson. The company’s investigators rely on their own sleuthing skills and the eyes and ears of Baker’s grease collection drivers and other area renderers in what is a team effort with private and government entities to stop the theft of used cooking grease in “Fabulous Las Vegas.”

California Connection

Since August 2008, private investigators at Baker Commodities in Los Angeles, CA, have made 54 arrests for grease theft throughout California, including four suspects being charged with felony grand theft. These cases are still pending. The others were charged with misdemeanor infractions with some being fined and ordered to pay restitution. Over $20,000 in fines have been issued and nearly 25 percent of the state’s registered transporters have lost their
Restaurant Owner takes on Thieves Personally

Greg Vasquez only had to be hit twice to take matters into his own hands. The third time was the charm. “They were sloppy and greedy, and that’s what made it easy,” he stated.

Vasquez owns two McDonald’s restaurants in the Southern California city of Hemet. In December, one of his maintenance crew notified Vasquez that the valve on the outside of the interior used cooking oil tank had been jammed open and a trail of grease was on the ground. Knowing the restaurant’s cooking oil vendor, Restaurant Technologies, Inc. (RTI) never leaves a mess like this, he contacted the company, which verified that the amount of oil collected from the restaurant had become much lower than previously. Both then concluded the grease was being stolen and RTI advised Vasquez to file a police report.

Fortunately, the restaurant has surveillance cameras in place that caught the theft, vividly showing a white Dodge dually pick-up truck equipped with a large cylinder tank in the bed and missing front and rear license plates. Also visible were two male thieves. Vasquez filed a crime report with the Hemet Police Department and submitted a copy of the surveillance video as evidence. The police noted the report, RTI came out and relocked the grease collection tank, and Vasquez instructed his maintenance crew to keep an eye out at this and a second McDonald’s he owns several miles away after learning the thieves had struck that location as well.

Within four days, the thefts occurred again with surveillance video showing the same truck and two individuals at about the same time of night breaking into the tank and leaving another mess of spilled grease. Vasquez made a second crime report, complete with video evidence, and the police distributed still photos of the vehicle to the night patrol. However, the officer told Vasquez that the department didn’t have the resources to stake out his restaurant and warned that the thieves would hit again. That’s when Vasquez made the decision to take matters into his own hands, telling the police, “I will catch them for you.”

“And I set out to do that,” he admitted, adding that there were two things wrong with these thieves: they were sloppy and they had a pattern, hitting about every fourth night. So when the fourth night rolled around just after Christmas, Vasquez set up his personal surveillance. He luckily arrived an hour earlier than the previous thefts had occurred and the thieves showed up shortly after.

“They were a little more hinky this time,” Vasquez noted. The thieves unrolled their collection hoses, then rolled them back in and left. Vasquez didn’t have to wait long until the truck returned a few minutes later and the two thieves proceeded to steal the grease.

Continued on page 12
New Grease Theft Law in North Carolina

Starting January 1, 2013, anyone collecting and hauling used restaurant grease in North Carolina must provide a statement of ownership to any purchaser, and those who steal that grease could face felony charges.

Under House Bill 512 passed last summer, individuals who steal used restaurant grease worth less than $1,000 would be guilty of a misdemeanor while anyone caught stealing more than $1,000 worth of grease would be guilty of a low-level felony. Although the bill is a step in the right direction for some, others in the state aren’t so sure it will work.

“We feel like we’ve lost $10,000 worth of product in the past six months,” Woodrow Eaton, a co-founder of Blue Ridge Biofuels in Asheville, NC, told a North Carolina news agency. “We haven’t had any luck ourselves catching anyone. We’re hoping law enforcement might take it [grease theft] more seriously as a result of the new law.”

But not all biofuel producers are convinced the new law will be helpful.

“We call it the grease police bill,” Lyle Estill, president of Piedmont Biofuels based in Chatham County told the same news outlet. “This bill doesn’t do anything about the people who are stealing grease.” He said the bill will help big rendering companies at the expense of hobbyists and others who collect and use or sell small batches of used cooking oil.

“Imagine the teacher who would collect the used grease from the school cafeteria once a week and sell it to my company,” Estill went on. “He’ll no longer be able to do that. It will have no impact, but it will shift the playing field in favor of big [companies].”

Buying Stolen Used Cooking Oil Doesn’t Pay

A southwest Missouri man pleaded guilty to evading federal reporting rules to conceal the fact that some of the used cooking oil he sold was stolen. Under a plea agreement in mid-December, Jesse Arnold, 46, of Sarcoxie, MO, was required to forfeit $207,817. In early January, he was sentenced to 10 years in federal prison, the maximum sentence, for his involvement in the theft of used cooking oil.

Arnold operated 4 States Grease Co., which collected used cooking oil and resold it to be used as biodegradable diesel fuel and made into recyclable products. Arnold admitted that he had reason to believe he was buying used cooking oil that had been stolen from businesses in Missouri, Kansas, Oklahoma, and Arkansas. According to the United States (US) Attorney’s Office, Western District of Missouri, various collection drivers sold the used cooking oil to Arnold “under circumstances that would have caused a reasonable person to know that it had been stolen.”

In order to avoid federal reporting requirements, Arnold made numerous withdrawals from his business checking account for less than $10,000 in order to purchase the stolen used cooking oil. Banks must file a currency transaction report for any financial transaction over $10,000. Many of the withdrawals from January 1, 2009, to September 30, 2011, were done on successive banking days for $9,000. The parties stipulate that the most readily provable amount that the defendant was responsible for structuring was $243,000.
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Is Biodiesel Ready... for a Catalyst Upgrade?

By Rachel Burton

Editor’s note – Rachel Burton just completed a two-year United States Department of Energy research project as principal investigator, examining the use of enzymes in biodiesel. She serves as a senior associate at MARC-IV Consulting and founded Piedmont Biofuels.

Renewal of the biodiesel tax credit in December’s fiscal cliff legislation has opened up a new window of opportunity for many feedstock and biodiesel producers throughout the United States. Some producers may be looking for new process technologies to improve production efficiencies or increase production capacity to achieve better scale economies. Biodiesel producers looking to increase production volume typically look at less expensive fats and oils as potential feedstocks. Lower quality lipids such as yellow and brown greases or acid distillates, which differ from traditional biodiesel feedstocks by exhibiting substantially higher free fatty acid (FFA) content, offer attractive alternatives. However, they are often underutilized due to the additional processing requirements that accompany a high FFA feedstock.

It is well documented that FFAs are created during the hydrolysis of fats and oils. Alkaline catalysts (e.g., potassium and sodium hydroxide) will react with FFAs to produce soap, an undesirable biodiesel contaminant. FFAs can be converted into methyl or ethyl esters for use as biodiesel by acid-catalyzed esterification, but this increases capital and operating costs as well as process complexity. If acid pretreatment is not used, high levels of soaps are formed during transesterification complicating downstream processing and reducing the yield of biodiesel. While FFA levels can be reduced by using acid pretreatment or other means, some FFA will be present during subsequent alkaline transesterification of the triglycerides and the inevitable soaps must be removed during biodiesel purification to achieve ASTM International standards. Performing esterification using a strong acid as the catalyst will reduce soap formation and improve yields. However, this pretreatment method also generates an acidic methanol waste with subsequent disposal. As a result, each process has its trade-offs between side streams, soap formation, yield, and economics.

As an alternative, enzymes known as lipases can easily catalyze conversion of both triglycerides and FFAs into fuel-grade esters. Enzymatic catalysis does not form soaps, operates at or near room temperature, does not require high pressure, and does not result in unintended side-reactions. Without soaps, water use associated with the typical water wash and water from soap formation is eliminated, significantly improving glycerin quality from 60 percent to more than 97 percent purity. In addition, less energy is used compared to the current process or other catalysts such as metal oxides. The enzymatic process accommodates both low and high quality feedstocks without biodiesel yield loss.

Enzymatic biodiesel production has been heavily researched over the past 15 years, resulting in the publication of nearly 1,000 scientific papers. Despite this intense examination by a number of skilled research groups, the technology has never been sufficiently developed to allow its adoption by the biodiesel industry. This is due primarily to the absence of affordable, commercially available enzymes and the technologies that use them, making the process economically competitive.

A limited number of researchers and companies have now pushed the laboratory research to a level that is commercially viable. Each of these entities has developed various approaches to adopting lipases as catalysts for biodiesel production. One technique is lipase transesterification as a replacement for traditional alkaline transesterification. This is best suited for high quality feedstocks like virgin vegetable oils or high quality animal fats, which are composed predominantly of triglycerides. This lipase technology enables high degrees of conversion of these triglycerides to fatty acid alkyl esters, typically yielding bound glycerol levels of 0.22 percent by mass or less when measured by ASTM D6584 total and free glycerol protocol. Often, a small amount of residual FFA, two percent or less, may remain in the resulting fatty acid methyl esters from this process. These FFAs can be esterified (by either enzymes or acid) or removed by a caustic treatment.

The second application for which enzymes have been developed as catalysts for biodiesel production is in the esterification of high FFA feedstocks; that is, as a replacement for the traditional inorganic acid catalyzed esterification. The tech-
Is Biodiesel Ready... for a Catalyst Upgrade?

by Michael J. Glance

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produces a soapy wastewater stream. By avoiding the need for alkaline catalysis by washing the biodiesel with water, which biodiesel plants remove the soap generated during conventional systems lack alkali and therefore no soap is created. Many FFA, or soap. In contrast, lipase-catalyzed transesterification enzymes as the catalyst for either the transesterification process. The alkali catalysts used in conventional transesterification processes react with FFAs in the system to create sodium or potassium salts of the esterification pre-treatment process. The alkali catalysts impart little incentive for their recovery, but this is not the case for the “free” or liquid preparation of enzyme catalysts. Though cheaper than immobilized lipases, their catalysts imparts little incentive for their recovery, but this is not the case for the “free” or liquid preparation of enzyme catalysts. Though cheaper than immobilized lipases, their leach into the feed stream.

Reaction conditions: 40-gram lipid sample, four percent wt., immobilized lipase, 13 percent of methanol, shaken at 45 degrees Celsius. Inset: Expansion of the time course at low FFA levels. The horizontal red line indicates acid value requirement. PFAD – palm fatty acid distillate.

Figure 1. Time course for FFA reduction in various lipid feedstocks by enzymatic esterification.

nique can also be utilized as an acid value reduction process for the low amounts of FFAs that may remain after the enzymatic transesterification process. This method helps in-process biodiesel achieve ASTM D664 specification for acid value. In addition, this same technique can reduce the low levels of FFAs found in some high quality fats and oils. Figure 1 displays typical time courses for this esterification technique with varied feedstocks. It is notable that acceptably low levels of residual FFA are achieved, and that this occurs within moderate reaction times.

How does the production process vary when using enzymes? For both esterification and transesterification, temperature is a consideration for the life of the enzyme catalyst. Typically, there are reactor conditions between 30 and 60 degrees Celsius. Alcohol exposure is also a factor for many of these catalysts, when using methanol, and attention must be given to alcohol-to-oil molar ratios to limit enzyme deactivation. Reaction time varies with process techniques; some esterifications can be complete within 30 minutes whereas some transesterification processes may require up to 12 hours. Proper choice of process conditions will determine whether a biodiesel producer can maximize product yield as well as maintain catalyst life.

Some biodiesel process issues can be improved by utilizing enzymes as the catalyst for either the transesterification process or the esterification pre-treatment process. The alkali catalysts used in conventional transesterification processes react with FFAs in the system to create sodium or potassium salts of the FFA, or soap. In contrast, lipase-catalyzed transesterification systems lack alkali and therefore no soap is created. Many biodiesel plants remove the soap generated during conventional alkaline catalysis by washing the biodiesel with water, which produces a soapy wastewater stream. By avoiding the need for a water wash to remove soaps, enzyme catalysis can reduce process water consumption and its attendant costs while also eliminating the soap waste stream.

Catalyst Availability and Re-use

The lipases produced by a multitude of microbial strains have been evaluated for the production of fatty acid esters, and some are now in the commercial arena. Some of the key strains that have been investigated are Candida antarctica, Thermomyces lanuginosa, Pseudomonas fluorescens, Pseudomonas cepacia, Candida rugosa, and Rhizomucor miehei. Complex plants and animals also produce lipases, but microorganisms are substantially easier to grow and manipulate and are thus the source of lipases used in biodiesel production. Commercial suppliers to the biodiesel industry include Novozymes and TransBiodiesel. Lipases are available in varied preparations, either immobilized on a solid support or dissolved in water (i.e., “free” form). When immobilized, the enzyme is prepared and adhered to a solid support structure, usually approximately 0.3 to 0.7 millimeters in size, to enhance continuous reuse of the catalyst. Immobilized enzymes can be used in either fixed-bed or stirred-tank reactor configurations. The enzyme and support remain in the reactor and should not leach into the feed stream.

Although the immobilized enzymes demonstrate good reusability, the costs of their preparation cause a higher initial investment. Thus, one of the key economic drivers to successful commercial implementation of an enzyme-based technology is the ability to reuse the catalyst. With traditional dissolved or homogeneous chemical catalysts, such as sulfuric acid or sodium hydroxide, producers typically do not have the ability to recapture the catalyst. Furthermore, the low cost of these catalysts imparts little incentive for their recovery, but this is not the case for the “free” or liquid preparation of enzyme catalysts. Though cheaper than immobilized lipases, their costs are sufficiently high to foster interest in their recovery and reuse. Until recently, this has not been reported.

Unique filtration technology available now can enable a biodiesel producer to reuse the liquid enzymes as well as the immobilized enzyme platform. This technology utilizes a type of membrane filtration called tangential flow filtration (TFF). One company who specializes in TFF, SmartFlow, leverages a patented cartridge technology that greatly improves flow rates by routing retentates through optimized flow-paths that significantly reduce fouling of the membrane surface, greatly increasing permeation rates. This technology allows filtration of the free enzyme from the aqueous phase while maintaining enzyme activity levels. By utilizing the TFF system, producers may be able to increase annual total plant throughput by reducing the volume of aqueous inputs, including the
Catalyst Continued from page 15

free enzyme that must be returned to the reactor for subsequent runs. This reduced liquid volume may help producers increase the total operating capacity of their plants. It is possible that other ultra-filtration designs will also work in this application.

Co-product Quality
An enzyme-based process converts a waste product of the biodiesel process, crude glycerin, into a true co-product of the process since no further significant post-processing is required. Crude glycerin directly from an alkali-catalyzed transesterification reaction vessel has few direct uses due to the high levels of soap, water, and methanol contamination. It must be acidulated to break the soaps into salts and FFAs by the addition of a strong acid, then neutralized back to a pH of 7.0 with sodium or potassium hydroxide after the FFAs are removed, followed by distillation or methanol removal using heat and vacuum. If the FFAs are removed, the glycerin purity approaches 80 percent, with water as a residual contaminant. If the salts remain, the glycerol concentration can be as low as 50 to 60 percent. Crude glycerin with this quality has a low value and is used primarily in low-grade applications or sold to companies that further upgrade and refine the glycerin to higher grades that are more commonly used in commercial products.

However, since enzymatic catalysis avoids the use of alkali, it produces no soaps. Consequently, the biodiesel producer realizes a reduced investment in glycerol cleanup while still obtaining a high value glycerol product. There is a significant value proposition in the capability of manufacturing a high value, refined glycerin product versus a crude glycerin product. Samples from the enzymatic facility deployed at Piedmont Biofuels have shown a 96.3 percent glycerin content for soy-based biodiesel while the yellow grease esters tested at 97.5 percent glycerin. This quality is sufficient to sell into the technical grade market at prices three to four times higher than crude biodiesel glycerin and 15 times higher than unrefined bottoms. Additional purification is needed to remove minute amounts of moisture and methanol, and some producers may want to treat for color bodies, depending on the parent feedstock.

Table 1 compares glycerol products from an enzymatic process and a chemical catalysis.

<table>
<thead>
<tr>
<th>Test</th>
<th>Unit</th>
<th>Method</th>
<th>Enzymatic Glycerol</th>
<th>Chemical Glycerol</th>
</tr>
</thead>
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<tr>
<td>Glycerol content</td>
<td>% mass</td>
<td>AOCS Ea 6-94</td>
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<td>55.78</td>
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<td>% mass</td>
<td>IUPAC 3.A.4</td>
<td>0.00</td>
<td>12.87</td>
</tr>
<tr>
<td>Methanol</td>
<td>% volume</td>
<td>EN 14110</td>
<td>0.14</td>
<td>0.45</td>
</tr>
<tr>
<td>MONG</td>
<td>% mass</td>
<td>IUPAC 3.A.6</td>
<td>0.40</td>
<td>29.17</td>
</tr>
<tr>
<td>Moisture</td>
<td>ppm</td>
<td>ASTM D6304</td>
<td>20500</td>
<td>22900</td>
</tr>
</tbody>
</table>


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sample analysis, there is a higher glycerol content in the preparation, which is accompanied by profoundly reduced levels of contaminating "matter organic non-glycerin," such as methyl esters, monoglycerides/diglycerides/triglycerides, or other organics. Methanol is easier to remove and thus lower in the enzymatic product. Due to the absence of alkaline earth metals from the enzymatic process, the ash content of the resulting glycerol is greatly reduced compared to that with conventional alkaline catalysis.

Summary
Currently available feedstocks like yellow and brown grease are five to 100 percent FFA and are significantly less expensive than virgin oils. Feedstocks such as distiller’s corn oil from dry grind ethanol operations that have been growing significantly in use as well as up-and-coming feedstocks like algae and jatropha oil all have FFA levels typically above five percent. With these new sources of biomass becoming available, biodiesel producers now have the opportunity to implement a reusable enzymatic catalyst technology that can fully process all feedstocks regardless of FFA content and without significant yield loss. A substantial increase in the quality of the glycerol co-product is an added benefit that can easily offset the capital investment for catalyst and process technology outlay.

With a one-dollar per gallon tax credit available to biodiesel producers in 2013, this may be the year for a catalyst and co-product upgrade. Are you ready?
Trends to Watch

By David Meeker, PhD, MBA
Senior Vice President of Scientific Services, National Renderers Association
Director of Research, Fats and Proteins Research Foundation

By agreement with the esteemed editor of Render magazine, I’m now writing a regular bi-annual article on top trends to watch in the rendering industry. Last year we thought we might do it annually, but one look at the February 2011 article indicated that a 2012 list would be so much the same – regulation, food safety, sustainability, redefining “natural,” economic recovery, and so on – that waiting a year was in order. Alas, the 2013 deadline loomed and after reviewing again the 2011 article, the rendering industry is still facing the same macro trends today. What then to write about?

Here’s what I won’t write about – a list of things we are all sick of hearing updates on: the election, the fiscal cliff, the European Union monetary crisis, fracking, Congress, the Royals (not the baseball team), and Honey Boo Boo or anything in the “reality” genre. I could go on, but won’t. A good place to start is usually to review other lists to see if there’s anything relevant for the rendering industry that can be adapted.

Getting started is always the hardest part. In that struggle, I came upon an intriguing list on how to overcome creative block: get enough sleep; read as much as you can; surf the web; watch “Law and Order” marathons; remember how lucky you are and quit bellyaching; keep a sense of humor; and a few others not fit for a serious industry journal (from a review of Breakthrough! 90 Proven Strategies to Overcome Creative Block and Spark Your Imagination on a very interesting website called Brain Pickings). In addition to references on where good ideas come from and how creativity works, other lists on this site include New Scientific Concepts to Improve Your Thinking and Why Does the World Exist?

Enough describing the thought process of my procrastination. Here’s my list of things to watch in 2013 as they relate to the rendering industry:

1. Regulation: Food Safety Modernization Act (FMSA), food safety, environmental, worker health and safety, and Obamacare.

2. Research: Animal Co-Products Research and Education Center (ACREC), Kansas State University, Agriculture Research Service, and nutritionists at large.


4. Partners, allies, and coalitions: Poultry Protein and Fat Council (PPFC), Pet Food Institute (PFI), American Feed Industry Association (AFIA), and livestock and veterinary groups.

Regulation

The National Renderers Association (NRA) typically spends a majority of time and efforts dealing with regulation. A big one on the horizon is the Food and Drug Administration’s FSMA. There was considerable procrastination (or was it pre-election apprehension) on the part of the Obama administration in pushing ahead expected regulation in 2012. The dam is expected to break during 2013 leading to a plethora of new regulations on all fronts. NRA will be watching closely to respond and inform as needed. Much more will be written on this in the future.

Research

Reorganization has led to research for the rendering industry being managed closer to policy needs and regulatory challenges. After some renegotiating and focusing efforts on behalf of both Clemson University and the Fats and Proteins Research Foundation (FPRF), ACREC is coming into its own. Early foundation efforts to create a critical mass of research knowledge available to address emerging and long-standing industry problems are starting to pay off. There are excellent projects underway to watch: critical kill temperatures in rendering cookers, more efficient fat extraction and wastewater cleanup, better raw material collection liners, Salmonella control, antioxidants, and non-feed uses for proteins and fats. Conversations on the next round of important research projects occur continually and at odd hours. ACREC leaders Annel Greene and Charlie Gooding are very responsive and tuned-in to the rendering industry’s research needs, and eight to 10 very accomplished researchers are working on FPRF projects continually.

Kansas State University announced in 2012 that a new pet food production program has been added to its excellent feed science program, so this is something to watch. Since the pet food industry is a very important set of customers for renderers with increasing mutual challenges (i.e., regulations), this program may offer a great chance to improve communications with the pet food sector, work on challenges together, and increase appreciation for and understanding of the rendering industry. FPRF has already funded the first project in this program on product shelf life and we expect a long and productive relationship. Greg Aldrich, a longtime friend to the rendering industry, is leading this effort. We will be developing research ideas with this program and hoping to attract funding from many sources.
The United States Department of Agriculture’s (USDA’s) Agricultural Research Service (ARS) has chosen to terminate a small but important research project supporting the rendering industry. The $743,000 per year “Biobased Industrial Products from Food Animal Processing By-Products” research project led by Rafael Garcia at the Eastern Regional Research Center in Wyndmoor, PA, is targeted for elimination as ARS tries to address the federal budget crunch. NRA has written to USDA and Congress to try to get this decision reversed. The industry doesn’t make many requests for government assistance in research, but we believe eliminating this research program is a mistake and will ultimately harm the sustainability of animal agriculture. We should learn in 2013 what happens here.

In addition to the programs described above, the rendering industry has had a very long association with animal nutritionists at universities and research institutions across the continent and elsewhere. They continue to reevaluate products as rendering processes improve and change, and to refine and define the nutritional needs of many species of “customers.” Dominique Bureau, Brian Kerr, Gerald Shurson, Jesse Trushenski, and Jeff Firman are among the current crop of nutritionists on the cutting edge in 2013. Results from nutrition research often find their way into updated dietary guidelines from the National Research Council and others. We expect continued good developments on this front.

Hot Topics

*Salmonella* has been a nemesis for the rendering and other industries for a long time. Much progress has been made to bring down the incidence in rendered products. Renderers know cooking works, and there will soon be detailed verification data to prove it, but we continue to be challenged by recontamination from many possible sources. The industry has been helping design new work in an attempt to nail down exactly where the *Salmonella* reentry points are and what to do about it. In the last couple of years, some clarity has been gained on the livestock side with FDA specifying a handful of serotypes as pathogens of concern rather than the entire class of *Salmonellae*. However, the added FDA clarity on the pet food side brings a new wave of concern and need for further attention because in pet food, all *Salmonella* species are considered a hazard in finished product. It may be too much to expect solutions in 2013, but hopefully some efforts will be set in motion to solve additional *Salmonella* challenges in the near future.

Oxidation is another longtime nemesis that has received increased attention recently. The industry is unsure how to measure it, how to prevent it, how to mitigate it after it occurs, or what the consequences are in many cases. Recent FDA actions on ethoxyquin have brought into question prevention methods that have been used for 30 years. Here’s hoping that 2013 brings some short-term solutions so renderers can continue to use methods they do know, and start hearing research reports on developments of longer term, better solutions for the future.

BSE, thankfully, is not something talked about every day like the industry was forced to eight years ago, but it still impacts trade and operations. A couple of “atypical” cases, which are apparently not connected to feed and may be simply a function of old age in very old cows, have hindered the United States as it seeks to be designated as “negligible risk” by OIE. A similar case in the heretofore BSE-free (more technically, negligible risk) Brazil may help the case for the United States. Look for OIE to finally, and belatedly, grant this country negligible risk status in 2013. This will not be a tectonic plate-shifting event for trade like the discovery of the first US case was, but it should help.

The North American Rendering Industry Code of Practice, a hazard analysis and critical control point-based program to address food safety, has long been described as a preemptive strategy in the face of increasing regulation and customer expectations. This will be pivotal year as the long-awaited regulations to implement FSMA will finally come forth. We’ll likely have to adjust the program, prepare for increased scrutiny, and pay even more attention to detail in hazard analysis and process control. The recent merger of the industry’s long-time auditing firm, the Facilities Certification Institute and Validus, a major agricultural International Organization for Standardization-certified auditing firm, is one step of many that will raise the bar again for participating plants. The rendering industry has much to be proud of in this program and the high level of participation, but we cannot rest on these laurels.

**Partners, Allies, and Coalitions**

PPFC is a consortium of poultry companies that produce poultry meal, feather meal, and poultry fat. In recent years, PPFC has become a very important partner with FPRF in funding research. Their participation has not only helped elevate the scientific expertise as the foundation selects projects, but has also allowed FPRF to fund additional important work. Recent talks with PFI structured around mutual food safety challenges give rise to hope that a similar strong relationship with these companies could advance future research. AFIA maintains a strong policy footprint in Washington, DC, and NRA stands shoulder-to-shoulder with them on many issues. Similarly, the rendering industry maintains strong ties with pork producers, beef producers, the poultry industry, veterinary suppliers and regulators, the meat packing industry, and so on. Look for strengthening and expanding these relationships in a challenging 2013 and beyond. As former USDA leader Bill Hawks always said, “Working together works.”

There, you have it. Ten paragraphs explaining a list of things to watch in four categories.

In anticipation of some readers’ reactions to this, I recall an interview with pop singer Bruno Mars I recently heard. He acknowledged to critics that his original works may sound shallow, but suggested to them, “You try writing a song, then!” I’m not suggesting *Render* readers do my job, but any ideas are welcome for next time!
Opponents of the Renewable Fuel Standard (RFS2) are putting a negative light on biodiesel in the press to convince American consumers that advanced biofuels increase their daily costs of living. This article is to help set the record straight with the biodiesel industry’s valued partners so all are armed with accurate information to correct these antagonists with a more appropriate food, then fuel message.

The RFS2 calls for 1.28 billion gallons of biodiesel to be used under the biomass-based diesel renewable volume obligations. Today’s biodiesel industry is more than capable of producing the additional 280 million gallons of biodiesel needed to meet the 2013 requirement.

As the biodiesel and feedstock industries advocate for 1.6 billion gallons for the 2014 renewable volume obligations, the rendering industry can help tell the story that many biorefineries use waste from food production. Leftover cooking grease from French fries and fat removed from steaks and pork chops account for a significant portion of biodiesel produced in the United States (US). The rendering industry has garnered significant value from this lower-value product model and consumers ultimately benefit. As biodiesel producers and renderers generate revenue for these lower-cost products, farmers are likely to produce more crops and livestock, bringing more protein and carbohydrates into the market for food.

Livestock producers are beneficiaries of at least three significant benefits for every gallon of biodiesel produced: (1) lower relative meal prices due to higher vegetable oilseed crush rates; (2) higher values per head due to increased animal fat prices; and (3) access to crude glycerin as an energy source for feed rations.

With growing demand for livestock feed, soybean meal supplies increase, which creates additional soybean oil for biodiesel utilization. Nationwide, 50 to 60 percent of all US biodiesel is still produced from soybean oil. A December 2010 study by Centrec Consulting Group, LLC stated soybean meal prices could increase by as much as $36 per ton if they weren’t gaining access to the value of soybean oil via biodiesel production. This lost market could cost domestic livestock producers an additional $4.6 billion for soybean meal purchases over the future five-year period (assumed period for the economic study was model year 2011 to 2015). Biodiesel adds value.

Renewable Energy Group (REG) is focused on being a lower-cost feedstock biodiesel producer. While the company is always looking for vendor relationships that benefit its bottom line, REG believes in using raw materials that create a greenhouse gas emissions advantage versus petroleum and support lower consumer food prices. According to a study commissioned by the National Biodiesel Board, since 2007 the price relationship between animal fats and soybean oil has become stronger and increased demand for fats and oils, which has led to increased fat prices. In fact, increased biodiesel production has led to greater demand for animal fats and, in part, led to higher value per head harvested for livestock producers. As an example, review of historic animal fat prices demonstrates that feeder cattle prices have been supported by strong demand for animal fats by uses such as biodiesel. Up to an additional $16.79 of value per head was generated when comparing “pre-biodiesel” tallow and inedible tallow prices with current fats and oils prices.

When the REG Newton biorefinery uses beef tallow, choice white grease, and poultry fat, it essentially reduces rising price pressures on meats in the grocery store. Simply put, biodiesel is supporting food security while making the United States more energy secure. The biodiesel industry needs the rendering industry’s help showcasing this process to policymakers and market influencers. Renderers can contact their legislator via REG’s advocacy website at http://advocacy.regi.com/.

Multiple Feedstock Production Technology Requires Efficiencies

REG’s array of biorefineries includes seven commercial-scale biodiesel facilities with a total capacity of more than 225 million gallons using technology capabilities to match feedstock availability in the area of each plant. Feedstock choice is based on economics.

As an example, the Ralston, IA, plant is co-located with a soy crush facility so it runs on soy oil. REG’s Albert Lea, MN, plant acquired in September 2011 is being upgraded at a cost of $20 million to be capable of using every Environmental Protection Agency (EPA) approved feedstock in the Midwest. The Danville, IL, Newton, IA, and Albert Lea, MN, plants form a functional capability basis, each one different but generally built with the same flexibility. The Seneca, IL, plant can convert free fatty acids as well as triglycerides into biodiesel.

Biodiesel producers with multi-feedstock capabilities using EPA-pathway approved raw materials are key to a diverse, sustainable feedstock market. In addition, a biodiesel company with a multiple feedstock, multiple vendor approach must be focused on highly efficient logistics and conversion capability.

Biodiesel Industry Supports Overall Economy, Offering Benefits to Consumers

The biodiesel industry creates localized job growth, increases the United States’ gross domestic product, and adds value to the agriculture, manufacturing, and transportation industries. Last year, the US biodiesel industry supported more than 63,000 jobs both directly and indirectly. (Analysts note that number would be 19,000 higher with the certainty
of the federal blender’s tax credit being in place.) The National Biodiesel Board projects the addition of 30,000 jobs with the increase of the RFS2 obligations in 2013.

As the US manufacturing sector begins to rebound after the recession, the biodiesel industry is doing its part by supporting $6 billion of gross domestic product in the American economy in 2012. That number is projected to grow to nearly $7.93 billion in 2013. The biodiesel industry is a meaningful part of energy independence; every gallon of biodiesel produced at home is one that does not have to be imported.

Biorefiners and feedstock suppliers under the RFS2 are delivering desired results to achieve US energy and food security goals. Farmers, food producers, and restaurants win as the biodiesel industry creates a higher source of revenue across the supply chain. These food producers are rewarded with better margin opportunities, which can lower food prices and save consumers money. That’s not the “food versus fuel” fallacy that RFS opponents want you to believe, but rather food, then fuel.
Biofuels Bulletin

By Tina Caparella

February 2013

Biofuels Tax Credits Extended, Now Include Algae

As part of a larger fiscal package passed by the United States (US) Congress at the end of 2012 to avoid what was dubbed the “fiscal cliff,” biodiesel tax incentives that had expired December 31, 2011, were reinstated for 2012 and 2013. Retroactive to January 1, 2012, for two years—meaning they expire again at the end of this year—is a one dollar per gallon biodiesel and renewable diesel blender’s tax credit that now, for the first time, includes algae-based fuel. However, not included in the package was a 50 cent per gallon alternative fuel mixture tax credit that was previously in place.

According to the National Biodiesel Board (NBB), a recent study by Cardno ENTRIX, an international economics consulting firm, found that the biodiesel industry would have produced an additional 300 million gallons in 2012 with the tax incentive in place. That would have provided about 19,000 additional jobs, for a total of just over 83,000 jobs supported by the industry nationwide, according to the study. Looking to 2013, the study found that the industry would support some 112,000 jobs nationally with the tax credit in place, versus about 82,000 without it. Additionally, the return of the incentive is projected to increase household income by approximately $1.6 million this year while providing an additional $3.1 billion in gross domestic product.

Along with the economic benefits, Anne Steckel, vice president of federal affairs at NBB, emphasized that biodiesel is helping reduce America’s dependence on imported petroleum and making the country less vulnerable to global petroleum markets, while significantly reducing tailpipe pollution and greenhouse gas emissions.

The Algae Biomass Organization is particularly pleased now that algae is included as a “qualified feedstock” in the tax incentives, but not everyone is happy with the tax credits being extended at a total cost of $2 billion to US taxpayers.

The International Institute for Sustainable Development (IISD) believes it is an “irresponsible move at the best of times, but is scandalous when Americans are preoccupied with a ballooning budget deficit,” according to Marc Halle, vice president, International, of IISD, a public policy think-tank based in Switzerland. The organization went on to state that applying the tax credit retroactively creates no additional biodiesel production.

In October 2011, the National Renderers Association took a neutral stand on the tax credit incentives, but vowed to actively support the continuation of mandates for biomass-based fuels using rendered products.

Australia Biodiesel Plant Back Up and Running

Australian Renewable (AR) Fuels, the country’s largest biodiesel producer, has recommissioned its Largs North processing and storage facility in South Australia, which was destroyed by a major fire on Christmas Eve 2011. The plant, rebuilt at a cost of $6.5 million, now includes a fuel blending facility and employs about 12 staff. The biodiesel is made from tallow and used cooking oil and is stored onsite. AR Fuels is exploring options to develop supply channels of recycled mill oils and other waste vegetable oils from the Asia Pacific region.

According to AR Fuels, the reopening of the 11.8 million gallon (45 million liter) plant comes amid renewed interest in biodiesel in Australia, with more transport and fuel companies looking to reduce carbon emissions under the new carbon tax regime. The company’s national business development manager Anthony Guy has been attending meetings with fuel and mining companies for potential supply talks.

“The stars and planets are beginning to align,” Guy said. “Our major customers are now seeing their clients asking for our product. The carbon tax regime is in place. We are now marketing not only to fuel retailers, but also directly to customers like transport companies and miners. The business is only going to grow.”

Currently fuel tax rebates are only available for five and 20 percent blends of biodiesel. However, AR Fuels does supply 100 percent biodiesel to customers who are willing to forgo the rebate or are using it for power generators on remote sites. The company also owns Biodiesel Producers, Ltd. at Barnawartha, VIC, along with the plants at Largs North and Picton, WA, giving it a total manufacturing volume of nearly 40 million gallons (150 million liters) of biodiesel.

Biox Terminates New York Harbor Land Lease

Canadian biodiesel producer BIOX Corporation has exercised an option that allows it to terminate the land lease agreement with International-Matex Tank Terminals (IMTT) to construct a 26.4 million gallon (100 million liter) per year biodiesel production facility in New York Harbor.

“We remain confident in the growth opportunities available to us in the market,” said Kevin Norton, chief executive officer of Biox. “However, given the significant change in the biodiesel market dynamics since we announced the IMTT agreement in June 2012, terminating the land lease agreement is the responsible decision.

“We also remain confident in the value of our Hamilton [ON, Canada] production facility, especially as we anticipate the market conditions in the US biodiesel market will return to a rational balance between supply and demand,” he continued. “We believe the challenges the biodiesel market has endured in 2012 are short-term issues that reflect the maturing of a relatively nascent sector. As the market evolves, we will be in a better position to move quickly at that time to pursue our growth strategies.”
Based on Biox’s decision to terminate the land lease agreement, IMTT has agreed to return, in full, the $4.1 million letter of credit related to the proposed tank modifications. Biox will also be reimbursed $1.4 million of the $2.1 million upfront payment it made to IMTT. The net difference of $700,000 will be expensed as a termination charge recorded in the first quarter of fiscal 2013.

Exercising the option reduces the term of the tank services agreement from 20 years to five years, with 53 months remaining. Biox is able to utilize the tanks or sub-lease the tank services during the remaining term of the agreement.

McDonald’s Emirates Marks Biodiesel Milestone

Following the launch of its biodiesel initiative in July 2011, McDonald’s United Arab Emirates (UAE) fleet of trucks has now travelled a combined 808,411 miles (1.3 million kilometers) running on used cooking oil from McDonald’s restaurants. The achievement highlights the benefits of biodiesel as an alternative energy source and has resulted in major reductions in the company’s carbon footprint.

McDonald’s UAE’s biodiesel campaign was launched with the support of Dubai FDI, the foreign investment promotion arm of the Department of Economic Development. Under this initiative, used cooking oil is collected from McDonald’s restaurants across the UAE and converted into biodiesel by McDonald’s clean technology partner, Neutral Fuels. The biodiesel is then used to fuel the company’s truck fleet.

The biodiesel campaign has received international acclaim and recognition from the UAE government, media, and stakeholders around the world. As part of the campaign, McDonald’s UAE has also organized university and community lectures, along with leaflets distributed throughout restaurants to educate customers on the environmental benefits of biodiesel. In February 2012, the Dubai Road and Transport Authority recognized McDonald’s and Neutral Fuels for their commitment to sustainable transport when the Crown Prince of Dubai awarded them with the Dubai Award for Sustainable Transport in the Environmental Protection Category.

Following this success, Neutral Fuels announced plans to build its first biodiesel facility in Dandenong, VIC, Australia, just outside of Melbourne, converting used cooking oil into biodiesel for use by McDonald’s truck fleet in Victoria. The plant will have an initial capacity of nearly 400,000 gallons (1.5 million liters) per year, and will be upgraded to 1.5 million gallons (six million liters) as more restaurants are tapped.

The company currently has waste collection sites at 106 McDonald’s restaurants across Victoria and plans to service the fast food company’s remaining 105 outlets by early this year. According to Neutral Fuels, McDonald’s wants all of the estimated 1,000 restaurants in Australia to be integrated into the program by the end of 2013.

After the needs of the McDonald’s truck fleet are met, Neutral Fuels is free to sell surplus biodiesel to other buyers, which it has already begun doing in UAE. Neutral Fuels plans to roll out 16 additional biodiesel production facilities worldwide over the next three years.

Continued on page 25

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Resolving Conflicts and Reaping Benefits

By the time you get this issue of Render magazine, January will have come and gone, New Year’s resolutions will have been broken, and confusion and indecision will still prevail in the United States (US) capital. Since I don’t want to deal with the last item, please read Steve Kopperud’s column on page 6 for his take on what is going on in Washington, DC.

The National Renderers Association (NRA) and the rendering industry finished 2012 in a positive position. Trade associations service their members in many ways. For NRA, the focus is on government relations, trade, scientific services, public relations, and member services. Although 2012 was a busy year, results are sometimes hard to measure. NRA really doesn’t have a bottom line like its members. The association is not measured in dollars and cents or sales, so it is often difficult to quantify real tangible results, but as NRA strives to represent the rendering industry in a positive light with the public, the media, and elected and government officials, the hope is to provide a better business climate for its members.

This is done every day by the NRA leadership and staff. For whatever reasons, the rendering industry has become more visible to the public in recent years. It could be because of bovine spongiform encephalopathy (BSE). The industry has weathered a many-year storm over BSE and I’m not saying the storm is over – there are still some aftershocks to deal with – but over the last 15-plus years, rendering has been generally recognized by the media as a responsible industry. Press and media inquiries have resulted in more positive coverage than negative.

NRA received numerous media inquiries last year for various reasons, from BSE and grease theft to local issues in a particular city or state. I am surprised how many of the reporters had already gone to the NRA website before calling. Most of the reporters knew little or nothing about the rendering industry and were genial and inquisitive. By the time we end our call, I get the distinct impression they generally have an enlightened and positive understanding of the rendering industry. It really isn’t because I am good at informing them, it is more because we have such a positive story to tell.

Trade is another area where NRA is at work. Since BSE, the hard work to regain foreign markets for rendered products continues, but we are making progress. However, two areas where frustration sometimes takes over in NRA’s ability to gain access is tallow to the European Union (EU) for biodiesel purposes and regaining a lost market for meat and bone meal in Indonesia.

Even sound science and logic doesn’t seem to move the needle in the direction of opening the EU market. There are trade negotiators at the highest levels in government on the rendering industry’s side. In fact, after visiting with officials at the US Trade Representative office and the US Department of Agriculture (USDA), tallow to the EU has become a top burner issue in negotiations for a Free Trade Agreement. Negotiators contend that if we can’t solve something as simple as this, we are not going to be able to progress on much else.

In May 2012, an atypical case of BSE was detected in California. The US government took all the necessary steps to assure trading partners the case was atypical and that the US cattle herd and food supply were safe. The assurances satisfied most trading partners, except for Indonesia.

The export market for meat and bone meal to Indonesia was halted. In recent years, this market had grown to be quite significant for US renderers who export. Now, nine months later, NRA has been unable to reopen this market. It isn’t because we haven’t tried, but it appears the situation is the victim of an internal political debate. Trade agreements, government and industry delegations to Indonesia, demand for US product, and scientific assurances of the safety of the product don’t seem to have much influence until the political infighting gets resolved.

Speaking of NRA leadership, Chairman J.J. Smith was recently invited to address a group at USDA on the role of the rendering industry and its relevance to local/regional meat production. The audience of 30 to 40 people was the USDA Know Your Farmer, Know Your Food Task Force, all USDA employees representing numerous agencies assigned with the implementation of the initiative. The Know Your Farmer, Know Your Food initiative was organized by the current administration and led by USDA Deputy Secretary Kathleen Merrigan, one of the pioneers in the organic food movement. She understands the importance of the rendering industry and wants the task force members to get a better understanding and appreciation of it as well.

Smith did an excellent job of presenting the rendering industry to this group, making them aware of the size and scope of the industry. In doing so, he also related that doing business locally was an important ingredient to a renderer’s business.

This is not the type of audience I would typically be attracted to on first blush. My initial reaction was that renderers today operate on a larger scale that would not meet their needs. However, Smith put it all into perspective and brought a real appreciation to the industry. This is one of those cases where I am not sure what the tangible result might be, but it was an audience we want saying positive things about the rendering industry. You never know where you might reap benefits.
Pacific Biodiesel to Fuel Airport

The Hawaii Public Utilities Commission has approved a three-year contract for Pacific Biodiesel Technologies to supply biodiesel to Hawaiian Electric Company (HEC) for its new $20 million backup electricity generation plant being built at the Honolulu International Airport. Pacific Biodiesel will annually provide 250,000 gallons of biodiesel made locally from used cooking oil. Under the contract, HEC can buy up to an additional one million gallons annually.

Pacific Biodiesel’s Maui facility will handle pre-processing of the used cooking oil before sending it to the company’s new Big Island facility for production. The Big Island facility uses a new technology developed with grant money from the Hawaii Renewable Energy Development Venture that, according to the company, “removes virtually all trace impurities and results in biodiesel that is clear instead of amber.”

According to Pacific Biodiesel, the demand for biodiesel in Hawaii continues to grow because of the state’s aggressive renewal energy goals, which include achieving 70 percent clean energy by the year 2030.

HEC’s airport plant will use four diesel generators to supply up to 10 megawatts of electrical power and is expected to come online later this year. The utility has a deal with the state Department of Transportation’s Airports Division to be able to use electricity from the facility for up to 1,500 hours per year to supply the Oahu grid. However, in the event of an emergency or natural disaster, the plant will be able to separate itself automatically from the grid to supply emergency power directly to the airport.

Texas Man Guilty in Fraud Case

Jeffrey David Gunselman pleaded guilty in mid-December to 51 counts of wire fraud, 24 counts of money laundering, and four counts of making false statements in violation of the Clean Air Act. Thirty-year-old Gunselman was the owner of Absolute Fuels, LLC that he formed in April 2009.

Each wire fraud count is punishable by up to 20 years in federal prison, while each money laundering count carries a maximum penalty of 10 years in prison. Each false statement count is punishable by up to two years in prison. In addition, each of the 79 counts carries a maximum fine of $250,000.

Gunselman admitted that from September 2010 to October 2011, he devised a scheme to defraud the Environmental Protection Agency (EPA) by falsely representing that he was in the business of producing biodiesel, yet Gunselman did not have a fuel producing facility. Instead, his business operation consisted of falsely generating renewable fuel credits and selling them to oil companies and brokers. He instructed purchasers to wire payments to a bank account he solely controlled, and as a result, approximately $41.7 million was deposited into that account.

Regarding the money laundering convictions, during the same period, Gunselman engaged in monetary transactions in criminally derived property by purchasing real and personal property valued at $12 million with the funds derived from the wire fraud. Included in that property are several luxury vehicles; a Patton military tank; a Gulfstream airplane, professional basketball season tickets and corporate sponsorship; and agricultural, business, and residential real estate.

Gunselman forfeited all property obtained through his criminal activities and is in custody awaiting sentencing.
WRO Best Practice Guidelines

A road map for future directions of the World Renderers Organization (WRO) includes the development of industry best practice guidelines. As a starting point, guidelines for hygienic rendering have been drafted. Many countries already have codes of practice for hygienic rendering or regulations that rendering communities comply with and the WRO guidelines do not seek to supplant existing codes and regulations. Rather, WRO is keen to support renderers who do not have appropriate guidelines.

Codes of practice for hygienic rendering are not new. Experience has shown that where codes of practice are developed and implemented, regulators gain confidence in the industry. In cases where regulators can’t help imposing on industry, the existence of codes of practice has provided a starting point for developing appropriate regulations. There are several examples of regulations that have been modelled on existing industry codes.

The WRO guidelines can provide a similar starting point in countries that do not have industry codes or regulation to follow and, if necessary, can act as a starting point for developing regulations that are effective and practical. The guidelines cover management control and quality assurance, hygienic construction of premises, operational guidelines, sampling and testing, and traceability. The guidelines recommend that hygienic production of rendered products should be planned according to hazard analysis and critical control point (HACCP) principles.

HACCP principles are a uniform and widely applied method of planning for the production of safe food products. They are also applied to animal feed production and rendering, but because the principles were developed for food, applying them to non-food products can be confusing. For example, the definition of a hazard in the HACCP approach is “a biological, chemical, or physical agent in, or condition of, food with the potential to cause an adverse health effect.” However, if HACCP is applied to rendered products or animal feed, should this definition apply to hazards to human or animal health? If it applies to human health, the link between rendered product and human health is not always clear and this makes it difficult to conduct the required hazard assessments.

The implementation of HACCP can be difficult enough for food products for which it was designed. A successful HACCP plan should be developed by a team of experienced people with the necessary expertise. There are many examples or templates for HACCP plans for different products that teams can refer to, but not for rendered products. WRO has developed a model HACCP plan as an addendum to the guidelines for hygienic rendering. The WRO guidelines are not novel in that they borrow from existing codes, industry guidelines, and regulations, but a model HACCP for rendered products has not been readily available and the WRO model should be a useful guide for renderers around the world.

The model HACCP plan is based on guidelines for the application HACCP published by Codex Alimentarius. It addresses the 12 steps of HACCP, as set out in the Codex guidelines, by explaining each step followed by an example of how the step can be addressed and documented. The model HACCP plan includes an assessment of the hazards that could occur in animal feeds and possibly affect humans. The assessment considers the consequences of the hazards for human and animal health and provides comments on the likelihood of occurrence. Based on the consequences and likelihood, a conclusion is provided about whether hazards amount to a significant potential hazard that should be addressed in the HACCP plan.

The hazards that are assessed in the WRO model HACCP plan are from the Codex Alimentarius Commission document “Proposed Draft Guidance for Use by Governments in Prioritizing Their National Feed Hazards.” This document is being drafted by the Codex Task Force on Animal Feeding and is available at ftp://ftp.fao.org/codex/meetings/TFAF/TFAF7/af07_05e.pdf. Annex 1 of the document provides examples of potential feed hazards and the WRO HACCP plan assesses the hazards in the annex in terms of their significance in rendered products.

The annex to the Codex document has not yet been finalized, but provides extensive examples of hazards that could be associated with feeds and affect human health. In following the Codex document, the WRO HACCP plan provides assessments of hazards such as spore-forming and non-spore-forming bacteria, endoparasites, viruses, prions, chemical hazards including microbial toxins and organic chemicals, and physical hazards such as glass and plastic. The assessment justifies which hazards should be considered in a HACCP plan for rendered products and which are not significant.

The WRO guidelines for hygienic rendering and model HACCP plan are being reviewed by members before they are released for general use.

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Organized by the World Aquaculture Society
February 21-25, Nashville, TN
www.was.org

**Pacific Coast Renderers Association 81st Annual Convention**
February 22-24, Carmel Valley, CA
E-mail: caitosf@mcn.org

March

**Canadian Cattlemen’s Association Annual General Meeting**
March 5-8, Ottawa, ON, Canada
www.cattle.ca

**8th Annual World Biofuels Markets**
March 12-14, Rotterdam, the Netherlands
www.worldbiofuelsmarkets.com

**15th Annual International Aboveground Storage Tank Conference and Trade Show**
March 13-15, Orlando, FL
www.nistm.org

**National Grain and Feed Association 117th Annual Convention**
March 17-19, San Francisco, CA
www.ngfa.org

April

**4th Global Feed and Food Congress**
April 8-12, Sun City, South Africa
www.gffc2013.com

**National Institute for Animal Agriculture Annual Conference**
April 15-18, Louisville, KY
www.animalagriculture.org

April (continued)

**Petfood Forum and Workshop**
April 15-18, Schaumburg, IL • www.petfoodindustry.com

**American Oil Chemists’ Society 104th Annual Meeting and Expo**
April 28-May 1, Montreal, QB, Canada • http://annualmeeting.aocs.org

**National Renderers Association Spring Meeting**
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Hydrogen sulfide-producing bacteria include a wide variety of bacterial species that are ubiquitous in the environment and can grow in high protein products such as chicken feathers. Growth of the organisms can lead to production of hydrogen sulfide, which can be hazardous to worker health. Dr. Xiuping Jiang, professor in the Department of Food, Nutrition, and Packaging Sciences at Clemson University and a member of the Clemson University Animal Co-Products Research and Education Center, has recently concluded a proof-of-concept study developing a safe, biological control method for preventing growth of hydrogen sulfide-producing bacteria.

Raw animal by-products can contain many species of bacteria, including those organisms that can produce hydrogen sulfide gas under anaerobic conditions. The most common species of these hydrogen sulfide-producing bacteria are *Pseudomonas, Citrobacter, Aeromonas, Salmonella*, and *Escherichia coli*, but numerous other species are also recognized as being capable of generating hydrogen sulfide. These microorganisms can cause rapid spoilage of the materials at ambient temperatures. Hydrogen sulfide production not only decreases the quality of raw materials, but the gas is also extremely toxic for humans and animals. During a 12-hour transportation and storage time, the concentration of hydrogen sulfide in raw animal materials has been measured to easily increase to 700 parts per million, which is a level that can cause immediate death in humans (Beauchamp et al. 1984).

Bacteriophages are small viruses that act on specific bacteria. Discovered more than a century ago, these minute viruses have been used for bacterial control for over 60 years. Bacteriophages must find a precisely matching receptor on a bacterial cell wall of a particular species of bacteria. Upon finding a match, the bacteriophage will inject its nuclear material into the bacteria where the virus then commandeers the controls of the bacteria, produces multiple copies of itself, and then kills the cell and releases an “epidemic” of new, safe, bacteriophage particles to seek additional target bacteria – in this case, the hydrogen sulfide-producing bacteria. Bacteriophages are the most plentiful microbial entity on earth and are completely incapable of infecting anything except its target bacteria.

Prior to the discovery of antibiotics, bacteriophages were utilized as antimicrobials in medicine. Currently, several bacteriophages have been accepted by the United States Food and Drug Administration as “generally recognized as safe” for use in packaged luncheon meats to prevent pathogen growth. In recent years, interest in bacteriophages has grown as scientists seek alternatives to antibiotics in light of the rapid development of antibiotic resistance by bacteria along with the concurrent need for bacterial control methods. Bacteriophages were used in a study by Greer in 1986 to control growth of *Pseudomonas spp.* on steaks; phage treatment increased shelf life of the beef from 1.6 days to 2.9 days. Greer and Dilts (2002) also used bacteriophages in improving shelf life of pork products. Using a bacteriophage against the common pork spoilage organism *Brochothrix thermosphacta*, the study indicated that the shelf life of pork treated with phage was doubled from four to eight days. Bacteriophages have also been used successfully for reducing pathogens in other studies in live animals (Smith and Huggins 1983; Sheng et. al. 2006; Atterbury et. al. 2007).

Chao “James” Gong, a PhD student in microbiology, along with fellow doctoral students Spencer Heringa and Randhir Singh and post-doctoral Dr. Jinkyung Kim, first isolated several bacteriophages specific to hydrogen sulfide-producing bacteria from raw animal rendering materials. The team collected meat, chicken offal, and feather samples from local grocery stores and rendering processing plants and isolated 142 strains of hydrogen sulfide-producing bacteria from these materials, including *Escherichia coli*, *Citrobacter freundii*, and *Hafnia alvei*. They then isolated 52 bacteriophages specific to these hydrogen sulfide-producing bacteria. Using electron microscopy, the team identified the nine bacteriophages selected for use in a cocktail belonging to the families of *Siphoviridae* and *Myoviridae*.

Using a method of analysis involving restriction enzyme digestion with the endonuclease Dral, six different patterns were distinguished among the nine phages. The team developed methodology for quantitating the impact of the bacteriophages on hydrogen sulfide production. When these phages were used experimentally, it was determined that the treatment could delay the growth of hydrogen sulfide-producing bacteria for 10 hours at 86 degrees Fahrenheit (F) (30 degrees Celsius(C)) and for two hours at 72 degrees F (22 degrees C). This delay in growth of hydrogen sulfide-producing bacteria...
bacteria means a delay in production of hazardous hydrogen sulfide as well as improved freshness of the raw materials. Additional time would allow transport of materials to rendering facilities before onset of microbial degradation. The team also studied methods to maximize bacteriophage production and submitted a manuscript on this portion of the study to the Canadian Journal of Microbiology, which has been accepted and is currently being published.

In the second portion of the study, graduate student Chao Gong, postdoctoral Dr. Xiaohua Liu, and Jiang applied the isolated bacteriophages to raw animal materials. Using laboratory and greenhouse conditions, the team simulated transportation and rendering facility conditions to measure bacteriophage impact in a controlled experiment. The team prepared test strips impregnated with lead acetate to measure hydrogen sulfide production and used an electronic hydrogen sulfide monitor. Using laboratory conditions, application of phage to spoiled chicken, chicken offal, chicken feathers, and fresh chicken meat inoculated with hydrogen sulfide-producing bacteria resulted in 25 to 69 percent reduction in hydrogen sulfide production at temperatures between 68 and 98.6 degrees F (20 to 37 degrees C). Under greenhouse conditions, use of the phage resulted in 30 to 85 percent reduction of hydrogen sulfide in chicken offal and feathers. The team is currently working on a manuscript of these findings for submission to a refereed journal.

The significance and impact of this study is proof that bacteriophage control could limit growth of hydrogen sulfide-producing bacteria in raw rendering materials, thereby leading to less spoilage and providing increased safety for workers.

References

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Maintaining a Clean and Safe Rendering Facility

Rendering is one of the earliest forms of recycling and has gone through many changes throughout the years. One of the most significant changes facing the industry is continually reducing the environmental impact of the rendering process through more efficient equipment and environmentally friendly products used during routine equipment and facility cleanings.

It is important that each rendering facility follow an ongoing consistent cleaning schedule in order to keep all equipment working properly; reduce or eliminate potential safety issues, including the risk of fires; and maintain or increase overall productivity. Due to the large, continuous volume of products flowing through rendering plants on a daily basis, the need to clean all equipment and facilities efficiently is critical in minimizing overall downtime. This includes equipment designed for transportation, raw material handling, processing, in-plant movement, final product storage, delivery, and facilities that store all of the above.

Incoming Product

The majority of raw material from slaughterhouses is brought in by aluminum trailer, which is primarily used for its corrosion resistance due to the multiple cleanings they receive on a daily/weekly/monthly basis. In a few cases in the past, dangerous acids have been used in cleaning products to wash these trailers. Although these acids are highly effective in cleaning all surfaces, they will eventually damage aluminum trailers over time. This is evident if the aluminum finish on the trailer is “pitted” or has a white hue on the metal indicating an excellent chance that these dangerous acid cleaners have been used at some point to clean the trailer.

The other issue in using any acid product is that employees may be exposed to it, creating a health hazard. For example, hydrofluoric acid can cause some immediate discomfort when coming in contact with skin, but produces severe tissue damage and potential cardiac arrest after it is absorbed into the tissue and bloodstream. Therefore, it is highly recommended that acids (specifically hydrofluoric acid) are not used during the cleaning process. Other products available can clean just as well as those containing hydrofluoric acid. The best way to test these safe products is to contact a sales representative to come out and do a demonstration to show a product’s effectiveness.

Processing and Storage Equipment

During the rendering process, tons of raw materials are processed through various methods in the plant. This equipment needs to be cleaned routinely to minimize maintenance costs and downtime. Most rendering facilities take the processing equipment offline for a few hours or a day to perform routine cleanings. Finding a method and product that works effectively can help reduce this downtime.

From an environmental and safety standpoint, it is highly recommended that a non-acid, phosphate-free product be used to clean processing equipment. There can be issues with conveyor blades, chains, and other parts corroding and breaking over time if dangerous acids are used. Most of the metals used in equipment are not aluminum and therefore will corrode faster if acids are used during the cleaning process.

With a continuous stream of finished product housed in large storage tanks and bins, it is difficult to take these vessels offline to perform routine cleaning. However, it is highly recommended that routine cleaning be done to maintain finished product quality and minimize maintenance costs and safety issues.

Cleaning Systems

The rendering process yields many in-plant airborne fats, oils, and solid particles due to the amount of heat and steam used to separate the end products. These particles collect on every surface in the rendering plant and while most of these surfaces are not mechanical (moving) parts, they need to be cleaned on a regular basis in order to reduce or eliminate any contact or slip hazards associated with the build-up of this material. Another hazard that could occur is fire. If a fire were to start, it could quickly spread, burning this built-

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up material along the way and leading to damage to the plant that could result in days of downtime, depending on the severity of the damage.

One challenging cleaning issue for most rendering plants is finding a safe, effective product and system that will reach areas of the plant that are difficult, if not impossible, to reach. There are safe, effective products in the industry today along with delivery/application systems that can reach most, if not all, areas of a rendering facility. Some systems being used in rendering facilities today can even reach up to 40 feet away, keeping employees safe while getting to those hard-to-reach areas.

There are several high-pressure nozzles currently on the market. One very effective device is the downstream injector system. A normal high-pressure washer delivers the cleaning product up to 20 feet while the downstream injector system delivers cleaning solution up to 40 feet, reducing or eliminating the need for lifts, scaffolding, and manual labor to scrub hard-to-reach areas.

As stated previously, a variety of products have been used to clean equipment and facilities within a rendering facility. Some products are very harsh and dangerous acids while other products are not effective and require manual labor to clean the equipment and facilities. It is recommended to use a product that provides the best of both worlds – effective cleaning along with safe handling for employees. There are multiple products out there made by various industrial chemical manufacturing companies that are both safe and effective.

Although there are many products on the market today that are self-described as safe, it is important to check the labels or safety data sheets to ensure that the products being used do not contain hydrofluoric acid, ammonium bifluoride, phosphates, or solvents. There are safe, highly effective alkaline products that do not contain these harmful materials and are just as effective when used at the recommended dilution ratios.

In conclusion, it is very important to keep rendering plants clean for efficient productivity and for the safety of employees. Be sure to look at the types of cleaning products currently being used to ensure they are the safest, most effective ones available, and that the best method of delivery for those products is in place.
OSHA to Continue Aggressive Enforcement in 2013

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Legal topics provide general information, not specific legal advice. Individual circumstances may limit or modify this information.

Occupational safety and health concerns are not limited to the construction and general industries anymore. Over the past four years, the Occupational Safety and Health Administration (OSHA) has become increasingly aggressive in its enforcement practices in every employment sector, rejecting collaborative efforts with employers, such as partnerships, to enhance workplace safety in favor of enforcement with higher citation classifications and enhanced penalties. With the reelection of President Barack Obama and the understanding that Dr. David Michaels, assistant secretary of Labor, will remain the head of OSHA for another four years, employers across the board can expect the agency to continue its aggressive enforcement tactics in 2013 and beyond.

Enhanced Classifications and Penalties Becoming the Norm

Frequently, OSHA classifies alleged violations of its standards as either “serious,” meaning it believes there is a substantial likelihood of serious injury or death as a result of the violation, or “other than serious,” meaning that although a violation, OSHA does not consider it likely to result in serious injury. However, OSHA’s findings that a violation is serious, which comes attached to a steeper monetary penalty, have been on a steady upward trajectory over the last four years. Moreover, between 2010 and 2011, the last year for which penalty information is available, the per-citation penalty for serious classifications more than doubled. Between issuing more citations as serious and increasing the penalties for serious citations, an employer could easily find itself facing monetary liability well into six figures, without any accident or employee injury in the workplace.

Further, OSHA has become more aggressive in placing employers into the Severe Violators Enforcement Program (SVEP). SVEP was created as a means of focusing on and heavily penalizing employers whom the agency believes have shown indifference to their safety and health obligations by issuing repeat or willful violations. An employer in SVEP can expect increased and more comprehensive inspections – often enterprise-wide – and substantial penalty and other abatement enhancements if violations are found. Between July 2011 and July 2012, the number of employers placed in SVEP doubled, and OSHA has shown no signs of reducing the pace.

OSHA’S 2013 Agenda

Employers in general industry can expect OSHA to continue to focus on certain favored projects, including the following.

• Whistleblowers: OSHA has primary investigatory responsibilities for 22 different whistleblower statutes, from Sarbanes-Oxley to the Federal Aviation Act to the Affordable Care Act. The number of whistleblower claims and cause findings rose dramatically in 2012 and are expected to continue in 2013.

• Workplace Violence: While this hazard has attracted its attention for several years, OSHA has been particularly focused on the retail industry to ensure employers have policies in place and have properly trained their employees to recognize escalating situations and to seek assistance.

• Ergonomics: OSHA is focused, using its General Duty Clause, on industry-specific and task-specific guidelines to reduce and prevent workplace musculoskeletal disorders that are commonly the result of repetitive, forceful, or prolonged exertions of the hands or the frequent or heavy lifting, pushing, pulling, or carrying of heavy objects.

• Recordkeeping: OSHA has also toughened up on its recordkeeping requirements including OSHA logs, written compliance programs, and certifications. Although typically classified as other than serious violations, OSHA has been increasing the instances in which it has found recordkeeping violations to be “repeated” or “willful,” which carry with them a potential ten times penalty enhancement.

How to Prepare for the Coming Storm

OSHA’s aggressive enforcement agenda shows no sign of slowing down. Employers should therefore revisit their safety policies and procedures to make sure that they are comprehensive, that employees have been properly trained, and that the policies are being enforced and discipline for infractions is documented. This type of basic blocking and tackling will greatly reduce an employer’s exposure. Given OSHA’s current enforcement agenda, employers should particularly ensure the following are in place.

• A stand-alone workplace violence prevention policy, which advises employees that any type of violence or threatening behavior will not be tolerated, lays out the procedure employees should follow to report potential instances of workplace violence, and directs employees to seek assistance in any situation where they feel unsafe.

• A whistleblower and anti-retaliation policy that directs employees to report workplace concerns to a particular person or department, and a procedure for documenting and investigating any complaint, including the responsibility for following-up with the complaining employee to let him
or her know the situation has been addressed.

- Job hazard analysis, based on review of the OSHA logs and worker’s compensation data that reviews work tasks to identify repetitive or cumulative trauma stressors and identifies any reasonable means to reduce repetitive stress have been considered and implemented.

- Confirming the required compliance records are up-to-date, particularly if the employer has been cited by OSHA in the past for incomplete or missing compliance documents. OSHA requires some records, such as medical and employee exposure records, to be maintained for as long as 30 years after an employee’s separation, and employers should have a proper records retention policy in place.

Employers can and should take preemptive action to make sure their workplace is inspection-ready. With these recommendations, these liabilities can be reduced in 2013 and beyond.

EPA Finalizes Boiler Standards

In late December, the United States Environmental Protection Agency (EPA) finalized changes to Clean Air Act standards for boilers and certain incinerators. According to EPA, these standards will achieve extensive public health protections by slashing toxic air pollution while at the same time addressing feedback from industry and labor groups, increasing the rule’s flexibility, and dramatically reducing costs. The agency estimates that 99 percent of approximately 1.5 million boilers in the United States either will not be covered or will be able to meet the new standards by conducting periodic maintenance or regular tune-ups.

According to EPA, the final adjustments to the standards were based on an extensive analysis of data and input from states, environmental groups, industry, lawmakers, and the public. As a result of information gathered through this review, the final rule will dramatically cut the cost of implementation by individual boilers as compared to rules EPA proposed in 2010. At the same time, these rules will continue to deliver significant public health benefits. EPA estimates that for every dollar spent to reduce these pollutants, the public will see $13 to $29 in health benefits, including fewer instances of asthma, heart attacks, as well as premature deaths.

EPA has also finalized revisions to the Non-Hazardous Secondary Materials Rule to provide clarity on what types of secondary materials are considered non-waste fuels and offer greater flexibility in rule implementation. This final rule classifies a number of secondary materials as categorical non-wastes when used as a fuel and allows operators to request that EPA identify specific materials through rulemaking as a categorical non-waste fuel.

The National Renderers Association Environmental Committee is currently reviewing the final rules to evaluate their effect on the rendering industry. More detailed information on the final standards for boilers and incinerators is available at www.epa.gov/airquality/combustion.
Australia’s Rendering Leader Retires

On December 31, 2012, Graeme Banks stepped down as executive officer of the Australian Renderers Association (ARA) after 37 years at the helm. He began his service to the rendering industry in 1975 when the association was known as the Australian Meat and Bone Meal Shippers and Producers Association and the main issues facing the industry were either freight related or pertaining to efforts lifting export restrictions on rendered products. Banks is also national secretary of the Australian Skins, Hides, and Leather Exporters Association, a position he will retire from on March 31, 2013, after the group’s annual general meeting.

Dennis King, Southern Downs Management Services, has been appointed to both positions vacated by Banks.

Banks and his wife, Lynette, are well-known and highly regarded by rendering industry members around the world, having attended many rendering conferences both in the United States and in Europe representing the Australian industry.

Never one to shirk responsibility and always a busy man, Banks is currently national president and New South Wales president of Retina Australia, an organization whose main aim is raising funds for research to find cures for inherited retinal diseases (genetic blindness). Lynette suffers from retinitis pigmentosa. Banks is also actively involved as chairman of Parramatta Legacy, an organization devoted to supporting families of deceased servicemen and ex-servicemen. He is also highly regarded within the Australian Orchid Council, as a past president and current fellow as well as regularly judging at international events, roles he will continue in the future.

King began his career in rendering in 1988 at John Dee, an integrated beef plant, where he was marketer of all co-products and involved in the operations side of rendering and hide processing. In 2004, he began his own consulting company, Southern Downs Management Services, during which he worked mostly with Australian Dehydration Technologies, which has just finished building a new rendering plant to demonstrate their patented technology.

Schoenberg Passes

Richard C. Schoenberg, former general manager of West Coast operations for The Dupps Company, Germantown, OH, passed away in late December at the age of 80.

Schoenberg began his rendering career in the family business in Oregon. After a stint in the United States Navy, he went back into rendering by joining Keith Engineering in California. During his time with Keith, Schoenberg, along with help from other industry leaders, worked diligently to perfect and improve the continuous rendering systems that still populate rendering plants all over the world today. He joined Dupp's in 1972 and served as general manager of West Coast Operations until he retired after 37 years in 2009. He then served The Dupps Company as a valued advisor until the time of his death.

In 2007, Schoenberg was presented with the prestigious “Tallowmaster Award” by the Pacific Coast Renderers Association, which honors individuals for their distinguished service and outstanding contributions to the United States rendering industry.

H.J. Baker Receives Certification

H. J. Baker’s poultry feed additive facility in Fort Smith, AR, has earned the Safe Feed/Safe Food certification, a voluntary, third-party-certified initiative designed for feed mills and feed ingredient-related facilities in the United States, Mexico, and Canada. The program establishes comprehensive standards of excellence that go beyond existing regulations to show leadership and maximize food and feed safety. The Safe Feed/Safe Food program is administered by the American Feed Industry Association.

H. J. Baker’s Fort Smith facility manufactures feed ingredients for poultry and has more than 20 locations throughout the United States, Canada, and Mexico. The company is headquartered in Westport, CT.

JBS Purchases XL Foods in Canada

In mid-January, JBS USA’s Canadian subsidiary, JBS Food Canada, Inc. purchased certain Canadian operations of XL Foods. Under the agreement, JBS acquired the following assets: a beef packing plant in Brooks, AB, with capacity to process 4,000 head of cattle per day; a 1,000 head per day beef packing plant in Calgary, AB; a feedlot in Brooks with a one-time capacity to feed 70,000 head of cattle; and 6,600 acres of farmland adjacent to the feedlot.

The agreement between JBS and XL Foods further permits an exclusive option to purchase the operations of XL Foods in the United States (US), pending regulatory review by US authorities. The US operations will continue to be operated by XL Foods during the option period.

JBS will not assume any of XL Foods’ debt or liabilities.

Render welcomes your company news items. E-mail correspondence to editors@rendermagazine.com, or fax to (530) 644-8429. News items can also be sent via postal mail to Render Magazine, 2820 Birch Avenue, Camino, CA 95709.
Spooncer Bestowed Top Honor

William Spooncer, Kurrajong Meat Technology, Australia, has been appointed an honorary member of the Order of Australia for his service to the country’s meat and rendering industries. Instituted in 1975, the order is a pre-eminent way Australians recognize achievements and service of their fellow citizens.

Spooncer joined the CSIRO Meat Research Laboratory as a microbiologist. Before setting up his own company, Kurrajong Meat Technology, in 2004, he was with Australian Meat Technology and Food Science Australia.

In 1991, Spooncer initiated the first training school for personnel in the Australian rendering and allied industries. He continues to run these workshops, which are an integral part of the Rendering Industry Accreditation Program, with over 720 people having attained recognized accreditation in hygienic production of rendered animal proteins. Also since 1991, Spooncer has been a driving force in coordinating the Australian Renderers Association’s biennial international symposium to inform and educate the industry.

During the height of the bovine spongiform encephalopathy crisis in the early 1990s, Spooncer developed and negotiated a standard to validate the effectiveness of heat treatments in destroying pathogens in the rendering process, ensuring safe finished products. This process is now accepted as a third party audit system by countries importing rendered products from Australia. He also developed the Australian rendering industry’s code of practice that went into effect in 1996, which was accepted by the government and later became the Australian Standard for the Hygienic Rendering of Animal Products.

Additionally, as a member of the World Renderers Organization’s Scientific Advisory Panel, Spooner’s work has been invaluable, particularly his latest contribution, the production of the organization’s best practice guidelines, which he addresses in “International Report” on page 26 in this issue of Render.

Biogas Facilities Emerge in the West

Clean World Partners has opened its $14 million anaerobic digester system in Sacramento, CA, while Agri Beef Co. has completed a new biogas plant as part of its Washington Beef facility’s water treatment system.

With the help of a $6 million grant and feasibility funding from the California Energy Commission (CEC) in June 2012, Clean World Partners’ “organic waste recycling center” will convert up to 100 tons of food waste per day collected by Sacramento-based Atlas Disposal Industries from area food processing companies, restaurants, and supermarkets into renewable natural gas. The facility currently processes 25 tons of food waste per day. Groundbreaking for the larger capacity system took place in January.

“The CEC’s support has been critical to our success so far,” said Michele Wong, chief executive officer of Clean World Partners. The renewable natural gas produced by the digestion system will be used by Atlas Disposal Industries’ clean-fuel fleet as well as vehicles from area jurisdictions and agencies.

Agri Beef’s new biogas plant captures methane from an anaerobic lagoon to be used in the steam boilers at its Washington Beef processing facility in Toppenish, WA, reducing the processor’s use of natural gas by about 20 percent.

After it acquired Washington Beef in 2003, Agri Beef began making investments in and around the plant, with water treatment identified as an area of opportunity. In order to make use of the anaerobic lagoon’s methane, the water treatment lagoon was completely redesigned by adding belowground vents while trapping the gasses under a specially designed cover that encapsulates the lagoon. The captured gas is then pushed through a series of pressurized containers and a storage system, eventually being burned in the plant’s boilers.

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