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Bearing Fruit in the Food-Grade Lubricants Market

Addressing regulatory challenges while staying cost-effective is an ongoing challenge

By Lin Grensing-Pophal



Lubricant manufacturers always have to be concerned with regulations, and the production of food-grade lubricants is no different. Ensuring that food products are safe and free from contaminants is surely not overlooked by the modern consumer, either, making food-grade lubricants an area of hyperfocus for many ILMA members.

It seems that every new food safety incident, regardless of the source, prompts new concerns and, often, new legislation. That can become a challenge for lubricant manufacturers and distributors as they work hard to remain knowledgeable, compliant and safe.

According to Food Processing's 2018 Manufacturing Outlook Survey, product recalls were reported by one out of eight of the 241 respondents to the survey, in some cases carrying a cost of up to \$10 million.

"Almost 25 percent of respondents to the US survey ranked food safety as their top concern — ahead of cost control, labour safety and automation," according to an article in Engineers Australia's member magazine, *Create*.

Food Safety Challenges

NSF International, a U.S.-based nongovernmental organization, has established three levels of food-grade lubricant registration:

- H1: Lubricants that could come into incidental contact with food (e.g., on a conveyor belt)
- H2: Lubricants used in areas with no possibility of touching food
- H3 (soluble oils): Edible oils used on grills, hooks or trolleys to prevent rust or corrosion

"Global demand for food-grade lubricants is rising primarily due to the growth in the global food processing industry and introduction of highly stringent food safety laws," stated an

article on Facts Week. "The U.S. has a high number of regulations for food safety and also accounts for [a] large share of the global food grade lubricants market."

According to Andreas Adam, the international sales director at FAGOL AG, a German specialty lubricants developer and producer of private-label products, in an article for *New Food* magazine, "Due to the high impact that any safety breaches have on the consumer, the need for maximum safety and improved supplier responsibility via systems such as ISO 21469 products will continue to improve." Equipment, writes Adam, also continues to improve, pushing the need for better lubricants.

Regulatory Challenges

Food-grade lubricant manufacturers work hard to ensure lubricant safety while also attempting to manage costs for their customers. It's a tough balancing act that, in many regards, is becoming tougher.

"The biggest regulatory challenge we face is the limitation of what base oils and additives we can use in the formulations," said Sam Burkett, president of BioBlend Renewable Resources LLC. "Traditional lubricants have a vast array of base oils and additives, while food-grade products are limited to meet strict regulatory requirements."

More enforcement in the industry has increased the demand for high-performance products, he says.

"Helping our customers keep their products competitive, economical and within the regulations and independent monitoring surveillance is challenging, but necessary, to maintain the integrity of the food-grade segment," said Gavin Duckworth, vice president of national accounts with Functional Products Inc.

"Food-grade lubricant manufacturers work hard to ensure lubricant safety while also attempting to manage costs for their customers."

The regulatory challenges themselves can be perplexing to deal with, says Darren Booth, vice president of operations with Lubrication Engineers Inc. (LE), adding that perhaps the greatest challenge is the growth in the number of types of regulations that must be dealt with. "Food plants in the U.S. are regulated primarily by the USDA, yet our lubricants are not only regulated by them, but also EPA, DOT or any number of international regulatory bodies," he said. "Between all of the various regulatory bodies, there ends up being conflicting regulatory information or requirements."

John Sander, vice president of research and development (R&D) at LE, provides an example: an HX-1 additive that, per Environmental Protection Agency (EPA) guidelines, yields a suspected reproductive hazard on the SCS and label when put in at a concentration that provides the desired lubrication performance. "Who would want to use an additive in a food plant that is a suspected reproductive hazard, even though the formulation is approved for incidental food contact?" he asked.

"Keeping up with changes, overlapping regulatory requirements from local, state, federal and country regulatory bodies is overwhelming for our line of business and our customers," said Duckworth.

The challenges are definitely increasing from a labeling and hazard communication standpoint, says

“The food industry adds additional complexity and regulation related to both environmental and consumer safety issues.”

Sander. But, he adds, “On the formulations side, there are actually more additives that are approved than there were 10–15 years ago.” In 2011, the Food Safety Modernization Act was signed into law by President Barack Obama. The act requires higher levels of food-safety scrutiny for growers, harvesters and processors of food, Sander says. While lubricant manufacturers are not directly affected, “it trickles down to us because our customers are the harvesters and processors.”

In addition, notes Sanders, incidental food contact lubricants aren’t only regulated by government agencies — religious considerations may come into play as well. “Many lubricant companies also carry religious ethnic certifications that require formula review, plant inspections and product labeling,” he said. Each, added Booth, “imposes additional costs beyond that for non-food-grade lubricants.”

Growing Consumer Awareness Adding to Scrutiny

Growing public awareness and interest in food safety issues is raising the bar and creating additional challenges for the industry.

“People want to know what they are putting into their bodies,” said Scott Arrington, technical director of G&G Oil Co. Inc., a distributor of food-grade lubricants. “With people looking for healthier and non-allergen choices for their foods, I believe this

carries on to the manufacturing of their food choices and not wanting to add any additional harmful product into their bodies.”

End users are demanding more bio-based and food-grade products, says Duckworth, increasing the complexity of finding new and high-performance raw material outside of traditional sources.

“With the growth of corporate farms with increased liability and responsibility, consumers’ increased demand for organic-growth food, regulatory oversight and protection will continue to increase,” said Duckworth.

Traditionally, he notes, the industry has been primarily focused on incidental contact. Today, he said, “with this additional demand for an organically grown food chain, any lubricants will need more direct-contact approvals.

With the growth of the population and limited farms to produce, further engineering and supply chain advancement will be required.”

In addition, he said, “with the population growth, the continued depletion of natural resources further compounds regulatory oversight demand.”

All of these factors will place additional requirements on lubricants in all aspects of food production and transport, he says.

How the Industry is Responding

At BioBlend, said Burkett, “we use three main base oils that allow us to meet all performance requirements in the industry.” That includes natural esters, traditional petroleum white oils and food-grade synthetics. “Each





has advantages in specific applications and allows BioBlend to have a wide range of products based on cost and performance,” he said.

As a distributor, said Arrington, “we heavily rely on our suppliers to be up to date with all of the new regulations that are coming forth in this sector. You have to partner with a manufacturer that you trust and is highly reputable in this arena so you don’t run into potential problems after you have provided a food-grade product to a manufacturing customer.”

Lubricant manufacturers these days, he said, can expect new questions, “such as which of any number of food allergens may be in your lubricant, or whether it contains genetically modified organisms.”

It’s important, said Burkett, “to understand the equipment and the

performance requirements of your customer; when changing from traditional lubricants to food-grade lubricants, always educate your customer.”

Often, notes Booth, misunderstandings by end users or consumers can affect manufacturers, who feel the need to address concerns, even if those concerns are unwarranted. Sanders agreed: “In some cases, we are finding that certain regulatory bodies are becoming overly cautious. Because more sensitive analysis methods have improved detection of hazardous ingredients, regulators seem to keep taking the limits down to lower and lower levels. Below certain points, many chemicals are no longer a hazard. Yet, because it can be detected, we are required to recognize it.”

“Because we are concerned about how fear might affect [marketability]

of the product, we sometimes find ourselves reformulating a very good lubricant to get around the negative perception by our rep and their customer,” Booth added, noting that reformulation causes additional R&D time and cost.

It’s important, notes Sanders, for manufacturers to consider all regulations when selecting lubricant components: “Before an ingredient is used, the risk toward sales and customer perception must be weighed.”

It’s a delicate balancing act that must take multiple considerations among multiple players into account. And, according to those in this space, the situation is not likely to become simpler as time goes by.

In fact, Duckworth says, manufacturers need to look into the future in an attempt to predict what new regulations might affect them. Functional Products, he said, is engaged in “forward-thinking product development that might fall under a future regulation.”

New Options and Alternatives

The industry is also continually interested in new developments that serve to both provide the lubrication required for safe and efficient manufacturing processes and ensure consumer safety. Soybean oil has long been known to be a cost-effective base material for a wide range of lubrication fluids that also has an environmentally favorable footprint. Recently, though, a new high-oleic soybean oil that improves thermal and oxidative stability has been introduced, opening up a wide range of applications for soybean oil in industrial products, including food production.

As Robert Brentin, a technical consultant with the United Soybean Board, notes, while there are a lot of lubricants that can do the job in terms of reducing friction and wear,

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preventing rust, and performing over a range of operating conditions (temperature, equipment runs, etc.), the food industry adds additional complexity and regulation related to both environmental and consumer safety issues.

High-oleic is big news in soybeans, says Brentin.

“Soybeans have been known as a good lubricant for centuries, but when it’s subjected to high temperatures it starts breaking down,” he said. “Oleic acid is one of the components found in many vegetable oils that is intrinsically more stable to heat and oxidation — and it’s more healthy to eat.”

“I’m amazed at what science can do sometimes,” Brentin said. “It’s really driving a lot of extended uses.” In this case, he said: “Soybeans taste better and change less with temperature — if I’m running a piece of machinery, I can count on it when it starts up and when it heats up — there’s not much difference. And it’s slippery, so it lubricates.”

It’s a macro trend that manufacturers should certainly be investigating, he said.

Regulation Likely to Stay an Important Consideration

“As long as food products are provided to you by someone else — and we don’t go back to a society that produces their own farm-to-table food — regulatory issues will continue to be updated to keep the public safe from unwanted toxins and contaminants,” said Arrington. Trusted partnerships, he emphasizes, are a must-have.

Duckworth notes that “regulations seem to be increasing for exports as more countries are instituting programs to protect health, safety and the environment.” He points to CLP (GHS), EU Ecolabel, LuSC, VGP and Cleangredients as examples of “regulations that have affected the food-grade lubricant market.” For example, he added, “EU Ecolabel affects more than 5,000 products and services in

the market; compound that by each regulation, and this is a challenge for each lubricant manufacturer.”

Regulatory changes are likely to continue into the future, says Sanders. “Hopefully,” he said, “they will be for the betterment of the consumer.” Still, he continued, “often they make it much more difficult on the lubricant producers.”

It’s important for all involved to do their due diligence as they explore the materials they use in the food manufacturing process.

“Interview, check and double-check your food-grade-product supplier,” Arrington recommended. “Make sure they are listed in the various NSF, halal and kosher approval sites. Tour their facilities to make sure they do have a white room and they are following procedures to produce food-grade lubricants.”

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