Fats and Oils and the Environment

Environmental concerns and regulatory measures affecting the fats and oils industry are highlighted in the following five articles. Preparing the articles were Gerald N. McDermott of Procter & Gamble Co., Scott L. Lofquist of Continental Commodities Corp., Kyd D. Brenner of the Corn Refiners Association Inc., Robert C. Hastert of Engelhard Corp. and Ron L. Moeller of Cargill Inc. Harold J. Sandvig, Associate Editor for *JAOCS* News for Plant Safety, assisted in the production of this feature on the environment.

Future environmental concerns

The following article was prepared by Gerald N. McDermott, technology leader for The Procter & Gamble Co., Winton Hill Technical Center, Cincinnati, Ohio.

New concerns will be involved in the edible oil industry's environmental control programs by the year 2010. Modified or new food products, with different responses in water pollution control, will be one cause of change. Greatly increased energy costs will lead to changes in wastewater treatment methods to processes with low-energy use. Increased energy costs will encourage the use of edible oils for the synthesis of a number of products, and associated air emission and wastewater control needs will require the use of complex processes largely new to the industry. An international effort to preserve and restore the earth's atmosphere will affect the industry all the way from crop production through processing. More restrictive control of toxics and hazardous wastes, particularly regarding groundwater quality, will require additional environmental efforts by the industry, especially in the chemical synthesis segment.

New food products

Differences in edible fat and oil consumption will come from the public's greater commitment to health maintenance. The fat-in-the-diet debate and over-consumption considerations will be scientifically resolved. People will turn to new products in response to dietary advice and from greater personal rejection of being overweight.

Refining processes and raw materials will be modified to yield products with desired dietary properties. New health-oriented fat and oil products will be tailored to contain the preferred fatty acid chain lengths, degree of saturation and position of double bonds. Consumer awareness will result in label statements and restaurant menu declarations attesting to the fat or oil used. To provide the raw oil suitable for these products, a shift to different plant species or to genetically altered current favorites will take place.

The volume of wastewaters and the quantity of pollutants involved will increase because of the more complex manufacturing processes. The new products will be a new ex-

perience for the food-oil segment of the industry as far as the environmental aspects of their use and manufacture are concerned, because these new materials in wastewater may not respond to the same biological treatment.

Energy costs and new chemicals

Triglycerides will become more attractive as raw materials for synthesis of chemical intermediates and products for two reasons. The depletion of readily available fossil fuels, coupled with reluctance of foreign petroleum producers to accept a reasonable dollar amount, will bring energy conservation into focus once again. The impact will be greater than ever experienced in America. Vegetable oils will not be markedly higher in price than petroleum sources and, therefore, will become more competitive materials from which to manufacture products such as fatty acid derivatives and even precursors for plastic, fiber or drug production. Also favoring such use is the fact that this raw material has much less environmental involvement than accompanies the extraneous materials in some coal- or petroleum-derived materials. Wastewaters and air emissions from manufacturing this type of chemical will be more extensive and complex compared to those from edible oil refining or soap making.

The second impact of high energy costs will cause a turn toward energy-efficient treatment processes. There will be a gradual shift in wastewater treatment for high-concentration process wastewaters from aerobic biological treatment, with its high energy consumption, to anaerobic biological processes. Plants providing treatment for direct discharge will be converted to anaerobic. The remnants of the aerobic system will be used for removing the last increment of pollutants.

The costs of community treatment together with pressure to reserve community systems for sanitary sewage will cause certain industrial plants to install their own anaerobic systems to decrease the organic load to the community system. The fervor for controlling discharges to community systems will continue to cause disagreement over sewer use appropriate for oil-bearing wastewaters. The technical facts that have established the basic ease of biodegradation, broader realization that food oils are a natural and normal part of domestic sewage, and records of years of trouble-free operation will not suffice in the more super-sensitive communities. In some cases, plants will provide treatment at the manufacturing site. Those who persevere in depending on the compatibility of the wastewaters to municipal treatment will still have available the advantages of joint treatment.

Toxics and hazardous wastes

The current program on toxics and hazardous waste materials has not been a great burden to the industry because the only impact has been on metal catalyst and bleaching earth disposal. However, if the increases in chemical synthesis predicted prove true, environmental control programs will become more complex, particularly if any compounds are present that are toxic to organisms used in bio-monitoring. Aromatics, amines, halogenated products and phosphorus complexes, if encountered in toxic concentration in an emitted or discarded waste, could necessitate the complex control mentioned. At particular locations, industries will reduce the toxics to permitted concentrations before being allowed to discharge to municipal systems.

Environmental concern and health protection forces in our society will bring about close attention to groundwater quality beginning in the 1990s. Attention now focused on toxics in air and wastewater will include groundwater. The attention to groundwater will bear on the disposal or use of material that could become a toxic groundwater contaminant. The animal and vegetable oil processing industry's previous experience with materials associated with groundwater pollution has been with pesticides in the raw oil. Control of pesticides and herbicides in the interest of groundwater protection may be expected to help any oil contamination problem. A second helpful expectation is that users of groundwater will become accustomed to groundwater treatment before use in all cases, as is currently a universal practice for surface supplies. Guardianship of the quality of the manufacturing plant's own water supply also will be a priority item.

Global atmospheric problems

Another significant environmental issue of the next decade or two will develop from worldwide acceptance that the greenhouse effect from carbon dioxide is to be dealt with along with ozone depletion and the addition of acidic materials to the atmosphere. Programs to minimize the additional discharge of carbon dioxide to the atmosphere and to reduce that present will be initiated. Such will include production of biofuels, fixing of carbon by storing crops including oil, and increased use of nuclear plants.

These will impact on all of society, of course. This industry is a relatively modest energy user. Nevertheless, emissions from boilers will be so controlled that fuel composition limits, operating attention requirements and emission cleaning will be severe.

Waste minimization

Laws are currently being proposed to minimize the use of materials that are going to be discarded soon after purchase. As a result, some packaging practices will be affected. The animal/vegetable oil industry will be only modestly affected. The remedy will come from requirements for home separation of garbage and use of recovered glass, metals, plastics and fuel. Packaging materials to accommodate these practices will be required.

Closing

In summary, there will be no slacking of the environmental control pace; this is not just a fad. Politically, the attention to environmental control will continue to grow. The changes, however, will be evolutionary rather than cataclysmic. The control technology needed currently is in hand. The industry will be able to handle the technology and costs in stride.

FEATURE

Proposition 65 opens 'a can of worms'

The following article on California's Safe Drinking Water and Toxics Enforcement Act, commonly known as Proposition 65, was prepared by Scott L. Lofquist, manager of quality assurance and technical services for Continental Commodities Corp. in Vernon, California.

According to a satirical little theory entitled Zymurgy's first law of evolving systems dynamics, the only way to recan a can of worms once you've opened it is to use a larger can. And, so, California's Proposition 65—Safe Drinking Water and Toxics Enforcement Act—becomes the latest illustration of this law. Who could have foreseen the far-reaching implications of a law so simple in intent as to not require government standard-setting or regulations to implement?

Fueled by a desire for a toxicant-free environment, the government's apparent inability to regulate the spread of the toxicant problem, and the disaster at Bhopal, India, California voters adopted the act by an almost two-to-one margin on Nov. 4, 1986.

Proposition 65, considered unique among environmental laws, radically alters current environmental policy. The act became law as soon as the voters approved it. Businesses must now comply with "no discharge" and "clear and reasonable warning" requirements for chemicals deemed by California to cause cancer or reproductive harm. The "no discharge" provision prohibits businesses from knowingly discharging significant amounts of listed chemicals into drinking water or onto land where the chemicals may enter a drinking water source. The "clear and reasonable warning" clause requires companies "in the course of doing business" to give individuals prior notice that they may be exposed to harmful chemicals. Those warning requirements apply to work areas, consumer products and ambient environmental exposures, such as air or water exposures.

Proposition 65 also provides for citizen enforcement if designated officials fail to act on a complaint and places the burden of risk assessment squarely on the shoulders of business. Even though the state has not yet determined risk levels for many compounds covered by the act, companies still are liable for the release of those chemicals. They must make risk assessments based on the best available data and hope those assessments are adequate.

State responsibilities

To fulfill the act's provisions, California's governor was required to publish by March 1, 1987, a list of chemicals known to the state to be carcinogens or reproductive toxicants. An update is to be published annually.

By Jan. 1, 1989, a second list was to be published listing those chemicals required by state or federal law to be tested for their potential to cause cancer or reproductive harm. This second listing of chemicals, which is to be published annually, may contain chemicals subject to Section 4 test rules of the Toxic Substance Control Act (TSCA), pesticides evaluated to fill gaps in current data required by California's Birth Defects Prevention Act, and chemicals tested by the National Toxicology Program.

Proposition 65 also provides designation of a lead agency, formation of a state Scientific Advisory Panel and enforcement of the act's requirements. California's Health and Welfare Agency has been named the lead agency, and its responsibilities include issuing proposed rules, conducting public hearings and guiding implementation of the act.

The state's attorney general, the local district attorney's office and certain city attorneys are responsible for enforcement. Other government officials, although not responsible for enforcement, have an added incentive to see that the regulations are carried out. If any government official discovers that an illegal discharge occurred or may occur, that official must report it to the local board of supervisors and the health officer or face losing his or her job. This could put companies in a precarious position even when seeking information from public officials. Private citizens also have the right to bring action against violators if officials responsible for enforcement fail to respond within 60 days of a complaint being filed.

Penalties

Businesses ignoring the requirements of this law should reconsider in light of the consequences. Convictions for noncompliance draw penalties up to $2,500 per violation for each day the violation occurs. Penalties imposed under existing hazardous waste laws are doubled to $100,000 for each day hazardous waste is transported or discharged to an unpermitted facility. A new provision includes a fine of up to $250,000 per violation per day if the violation results in great bodily injury or poses a substantial potential for death. As a further incentive for enforcing the act, the so-called "bounty hunter" provision rewards enforcing parties, whether official or private, 25% of the penalty upon the violator's conviction.

Risk assessments and compliance

Closing your eyes on this one will not make it go away. Several states have already either adopted or are in the process of adopting similar laws. Among them are Illinois, New York, Missouri, Ohio and Louisiana. Considering the facts that the California law provides for prosecution and that consumer products either manufactured in or entering the state must be in compliance, business has no alternative but to assess its risks in view of potential liability.

In all probability, risk assessment will be a continuing function for business. Proposition 65's regulated chemicals list currently contains approximately 240 chemicals. Of these, pesticides and aflatoxins are of particular concern to the fats and oils industry.

As the various agencies evaluate chemicals and more data become available, the list promises to expand. Businesses, in an effort to remain in compliance, will have to consider each new finding as it pertains to their

operation and determine what impact, if any, it will have.

If a business manufactures or uses a chemical on the chemical source list, it must establish compliance with the act's regulations of "no discharge" and "clear and reasonable warning." Management must adopt a position of total commitment to the spirit of the act and develop not only a strategy of compliance but a defense of its risk assessments as well.

Once a company has determined that it manufactures or uses a chemical on the regulated list, it should perform a quantitative risk assessment of the chemical's impact on the operation. The state's Health and Welfare Agency has determined that a chemical poses no significant risk if no more than one person in a population of 100,000 people exposed contracts cancer over a lifetime. For reproductive toxicants, Proposition 65 mandates that exposure levels must be 1,000 times lower than a "no observable effects level" (NOEL).

To aid businesses in their risk assessments, the Health and Welfare Agency will issue Safe Use Determinations (SUD) at the request of a business or trade association. Requests are to be in writing, and specific as to the chemical and use in the manufacturing process. The state charges $500 plus costs for this service. However, this information is not legally binding on the enforcing parties or the courts. This means that if a case goes to court and new information about chemicals is presented, a company cannot say it was in compliance simply because it followed safe use determinations written by the state. A company may not be able to argue convincingly that it used the best data available.

For exposures exceeding the no-significant-risk level for carcinogens or the NOEL level for reproductive toxicants, clear and reasonable warning must be provided to individuals prior to exposure. Most companies are satisfying this requirement in the work environment by posting warning signs in affected areas. However, as one commentator noted, signs are not specific as to the hazardous chemical in question.

Without thorough employee training in the use and understanding of material safety data sheets, signs also do not necessarily establish compliance. Only when a facility is operating within the guidelines set forth in the OSHA (Occupational Safety and Health Administration) Hazard Communications Act and providing the necessary warnings is it in compliance with Proposition 65 requirements.

Consumer products, likewise, require warnings if their intended use provides a significant exposure to a carcinogen or reproductive toxicant. Warnings may be provided on the product label or inserts, by written warnings placed on shelves or in menus, or through media advertising. Under current provisions of the act, any business which manufactures, produces, assembles, processes, handles, distributes, stores, sells or transfers consumer products falls within the scope of this requirement.

The Health and Welfare Agency, however, has allowed temporary exemptions to food, drugs, medical devices or cosmetics provided they are in compliance with federal or state regulations. Needless to say, this is an issue that is currently in court simply because Proposition 65 does not provide for any exemptions to its requirements.

The coalition of consumer, environmental and labor groups that brought the suit said many substances which already are covered by state and federal regulations have not been adequately tested for their carcinogenicity or reproductive toxicity. The group claims the temporary regulations are unlawful and are an obstacle to the intent of Proposition 65. Several other court cases are pending concerning the list of chemicals and who should qualify as recognized experts. One of those cases involves the question of whether the U.S. En-

vironmental Protection Agency (EPA) should be recognized as an expert on toxicants which may be covered by Proposition 65.

When the dust finally does settle in the legal arena, Proposition 65 and similar legislation will still be with us. Exercising common sense on both sides of the issue should be a priority above all else. The intent of the act is both good and needed, but it should not become so burdensome as to force business to a standstill.

More information on Proposition 65 may be obtained by contacting the California Chamber of Commerce, PO Box 1736, Sacramento, CA 95808, 916-444-6670 or Health and Welfare Agency, 1600 9th St., Room 450, Sacramento, CA 95814, 916-445-6900.

Regulatory concerns for corn refiners

The following article was prepared by Kyd D. Brenner, director of public affairs and secretary of the Corn Refiners Association Inc., Washington, D.C.

Corn refining, or corn wet milling as it is also known, is a hybrid among agricultural processing industries. The roots of corn refining are on the farm, but its reach extends into nearly every area of food production and industry. Our business shares many concerns with traditional agricultural processing industries, but our markets reach far beyond the dinner table. Food, beverage, paper, textile, adhesive, chemical, motor fuel and pharmaceutical markets are mainstays of corn refining.

In the same way that corn-refined products have uses in many industries, the process of corn refining draws on technology from many other manufacturing industries. A modern corn refinery is about as far from the traditional concept of a "corn mill" as the space shuttle is from Orville and Wilbur Wright's first flying machine. The inside of a corn refinery in many respects resembles a chemical processing facility more than a food manufacturing plant.

As a result, corn refiners fall under the watchful eye of nearly every regulatory agency in the government. The major environmental regulatory issues faced by corn wet millers can be separated into two basic categories: discharge and disposal regulations, and worker safety and chemical information regulations.

Discharge and disposal

Air and water discharge procedures are among the oldest and most established environmental regulations faced by corn refiners. By wet milling's very nature, corn refiners generate substantial amounts of wastewater which must be fully treated prior to discharge directly to rivers or pretreated prior to discharge to publicly owned treatment works (POTW).

U.S. Environmental Protection Agency (EPA) regulations limit the amount of biological oxygen demand and total suspended solids present in the industry's wastewater, which consists of organic, degradable material. Facilities discharging directly to rivers or streams must obtain permits through either EPA or a state agency delegated enforcement responsibility by EPA. Plants discharging to POTW must meet both the local requirements of the municipal facility and EPA regulations limiting the degree to which waste loads from industrial plants can "interfere with" or "pass through" the local system.

Water discharge regulations were formulated generally in the 1970s, following passage of the 1972 Clean Water Act. Bringing plants into compliance required major engineering efforts and capital expenses during that period. Today, water effluent concerns generally are limited to ensuring proper operation and maintenance of existing systems.

The Clean Air Act, with its system of national limits on stack emissions of combustion products such as sulfur dioxide, carbon monoxide, nitrous oxide and particulate matter, continues to challenge the industry. Ever-decreasing limits on acceptable emissions from industrial power facilities require that corn refiners continue to invest in new air-pollution control and/or power generation systems.

Corn wet milling is an extremely energy-intensive process, and the power requirements of a modern facility rival those of many medium-sized cities. In an effort to escape the uncertainties which plagued the oil and natural gas markets in the 1970s, many refiners have returned to the use of coal for power generation. Concerns about acid rain and particulate emissions led EPA to publish the New Source Performance Standard for industrial boilers last year; this will require major investments in stack scrubbers for new facilities, even when the cleanest of available coal supplies is used.

A large variety of process chemicals is required for efficient operation of a corn refinery. Despite the general lack of toxicity of these products, many have been classified as hazardous by various federal or state agencies, and disposal must be properly conducted. The Resource Conservation and Recovery Act (RCRA) lays out requirements for regulation of waste generators, transportation of hazardous wastes and disposal of hazardous wastes in dumps and landfills.

As is the case in nearly every industry using electrical equipment, corn refiners in the last decade have faced the major task of locating, replacing and properly disposing of electrical transformers and capacitors which utilized PCBs. This project is either complete or nearing completion at most facilities.

Another energy-related concern has been the requirement under RCRA to inspect, and sometimes modify and/or remove, underground

storage tanks used for fuel and chemical storage, and to establish a system of monitoring potential leads from underground tanks.

Worker safety and chemical information

Over the past several years as refiners have come into compliance with basic disposal and discharge regulations, a new series of regulatory challenges has confronted the industry. This has taken the form of a number of new laws designed to inform workers, customers, handlers and communities about hazards posed by industrial materials.

Although most materials used by corn wet millers are nontoxic, some process chemicals pose well-recognized safety hazards and must be handled appropriately. Materials such as acids, caustic, solvents and industrial dusts may be hazardous if not properly controlled. This new system of regulations starts with preparation of material safety data sheets (MSDS) for any material listed by the Occupational Safety and Health Administration (OSHA) in its Hazard Communication Standard.

Although most of the materials on this list present well-recognized hazards, others, such as corn starch, have been added to the list because they may pose an industrial "nuisance" if they are present in too high a concentration. Unfortunately, the associated regulations do not differentiate between real and trivial hazards, and much time and effort have been devoted to preparing paperwork on intrinsically nonhazardous materials.

MSDS are the start of a long chain of information requirements for these substances, which include notification to workers of their presence, provision of safety data and handling procedures to customers, and disclosure to municipal authorities and the community of the type and volume of hazardous materials used at industrial sites. In addition to compliance with OSHA's Hazard Communication Standard, complex data reporting and emergency planning responsibilities are placed on industries and local officials by Section 313 of the Superfund Amendments and Reauthorization Act. While these regulations respond to the public fear of an American "Bhopal"-type incident, they also have raised difficult questions of trade secrecy, and in some cases can inspire unfounded fear in local communities.

New regulatory trends

In the last several years, the industry has faced a new series of regulations, this time springing from action either by state initiative or by individual state legislators.

Some states have recently passed laws governing disclosure of information about land transfers from industrial companies, requiring that detailed reports of the use and history of the site be provided to prospective land purchasers and, in some cases, to the state. At least one state has gone so far as to require state approval of the disclosure statement. The most widely discussed regulatory issue in the industry stems from state initiative—California's Proposition 65.

This act, simple on the surface, has become a many-headed monster for any manufacturing industry doing business in California, and even for firms which have no California-based operations but supply companies that do business in the nation's most populous state.

Proposition 65's two basic requirements are that companies warn citizens when they are exposed to carcinogens or reproductive toxicants, and that discharges of these materials into the water supply are prohibited. While the warning requirements imposed for food products allow exemptions in cases of insignificant risk or where the carcinogen is naturally occurring, waste disposal regulations contain few such exemptions and do not recognize the concept of insignificant risk.

Beyond the difficulty of compliance in California, Proposition 65 poses serious questions of interference with interstate commerce and conflict with federal food safety regulations. The Corn Refiners Association Inc. has joined with numerous other associations and food companies in mounting a

continued on page 174

federal court challenge to the constitutionality of Proposition 65, although resolution of the case appears some time off.

Regulations of the future

The corn refining industry has faced numerous regulatory challenges over the past two decades. This article has touched only on the major environmental regulations faced by the industry. Numerous other examples exist in occupational safety, food safety, pesticide policy, energy and labor policy.

Despite the much-discussed reduction in federal regulation during the Reagan administration, the regulatory burden of the industry has continued to grow during the 1980s. We expect the next decade to bring further challenges.

Major efforts are expected to come from individual states introducing Proposition 65 "look-alikes." At the federal level, current regulations which focus on providing chemical information may grow into further use restrictions and/or prohibitions of the use of certain materials. And, the Bush administration has promised to reinvigorate federal environmental efforts, leading to potential restrictions on coal use and major new efforts to control groundwater supplies.

Disposition of spent nickel catalyst

The following article on spent nickel catalyst disposition was prepared by Robert C. Hastert, manager of market and product technology for Engelhard Corp.

Nickel, as contained in spent nickel catalyst, is not currently classified as a hazardous waste by the U.S. Environmental Protection Agency (EPA). However, it is on the agency's suspected list and almost everyone agrees that sooner or later, spent nickel catalyst will not be allowed in landfill.

At least two states already have instituted such a regulation, and others are expected to follow. Fortunately, hydrogenators have a readily available means not only of negating any such potential regulation, but also of achieving very significant economic enhancement while doing so. This can be accomplished by selling spent nickel catalyst for recycling into consumable nickel products, e.g., as an ingredient in the manufacture of stainless steel.

Environmentalists, conservationists and experts in legal liability all endorse such an approach. With such endorsements, the obvious assumption would be that everyone is doing it. However, they are not.

Why? A principal reason is that many hydrogenators seem to be unaware of the economic facts. Either they have never seriously examined the economics or, more likely, have not done it recently. For instance, nickel metal, which was priced at approximately $1.65 per pound in January 1987, now is worth more than $5 a pound. Despite the increased price of nickel, it still is possible to operate a hydrogenation/filtration facility to negate even the most advantageous economics. This can be done almost entirely by the overuse of filter aid (diatomaceous earth).

Although it is essential to use some filter aid to effectively and efficiently remove nickel catalyst from hydrogenated oil, only a minimum quantity is required if a good filtering catalyst is used in the manner recommended by filter press manufacturers. Being employed by a catalyst manufacturer for many years, I naturally have had an ongoing interest in this subject. It is my observation that, with some notable exceptions, hydrogenators use two to five times as much filter aid as is necessary. The exceptions prove the point. They are hydrogenating the same oils with the same catalysts and filtering in the same equipment while using much less filter aid.

Filter aid is the culprit because it is both a diluent itself and also requires an equal weight of oil to wet it. Spent catalyst normally contains 50% oil. The other 50% are solids which are the sum of nickel, catalyst support and filter aid. It is possible to achieve 9-15% nickel content in spent catalyst, depending on specific equipment used, reuse practices and individual plant procedures. There are three reasons for the emphasis on nickel content of the spent catalyst: freight, reclaimer processing efficiency and oil loss. Figure 1 illustrates the economic effect of freight. At 3%, it calculates to $2.58 per pound of nickel; at 6%, it is halved to $1.29, and at 12%, it is halved again to $.645. Because spent

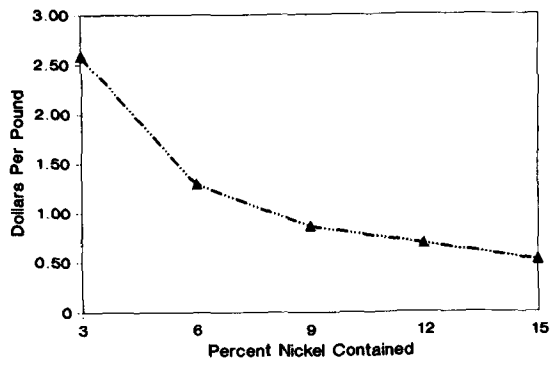

FIG. 1. Spent catalyst disposition. Freight cost per pound of nickel. Basis: $2,900 per 37,500 pound truckload ($7.73/cwt.).

catalyst is processed by the running pound, reclaimers also take nickel content into consideration in the pricing of its value. Although they do this in different ways, their bottom lines must be essentially the same as the spent catalyst market is competitive.

Figure 2 illustrates typical spent nickel marketplace values at varying nickel content based on several specific examples of the price of new nickel. Figure 3 summarizes the expenses and income from spent catalyst, again at several new nickel values. Figure 4 uses the Figure 3 numbers, but extends them to dollars for a hydrogenator disposing of 20,000 pounds of nickel a year. As can be seen, converting 3% nickel to 9%, when new nickel is priced at $5 per pound, increases the value by $62,800; converting 6% nickel to 12%, the value increase is $34,600.

Oil loss economics are even more significant. Every pound of spent nickel at a 3% concentration extends to 33.3 pounds of spent catalyst. As spent contains 50% oil, 16.7 pounds of oil are lost with every pound of nickel at a 3% concentration. Using a conservative $.30 per pound, these 16.7 pounds have a value of $5. Increasing the nickel content of the spent inversely reduces the oil loss and consequent cost, as depicted in Figure 5.

Figure 6 summarizes the individual and cumulative economics of both nickel and oil for a facility producing 20,000 pounds of spent nickel per year when new nickel is priced at $5 per pound. As can be seen, an out-of-pocket $100,000 per year oil loss at 3% nickel concentration will be reduced to $33,600 at 9%, a savings of $66,400. Adding this to the $62,800 increased value

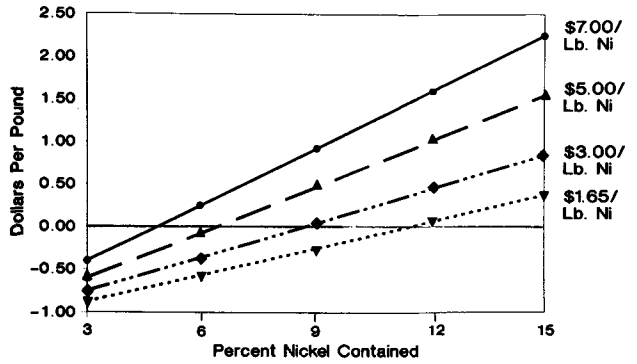

FIG. 2. Spent catalyst disposition. Value per pound of nickel at various new nickel prices.

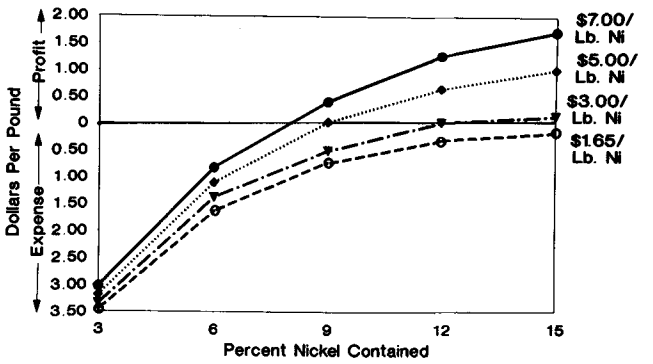

FIG. 3. Spent catalyst disposition. Profit/expense per pound of nickel at various new nickel prices.

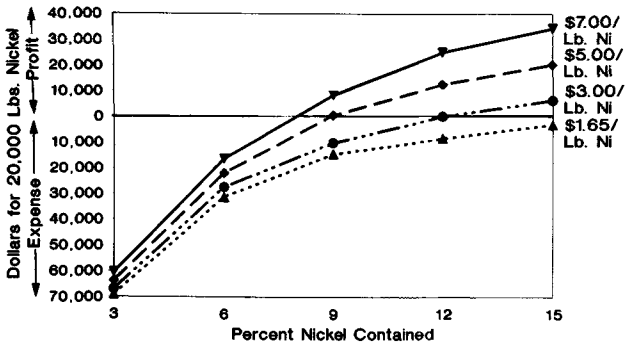

FIG. 4. Spent catalyst disposition. Profit/expense for 20,000 pounds of nickel at various new nickel prices.

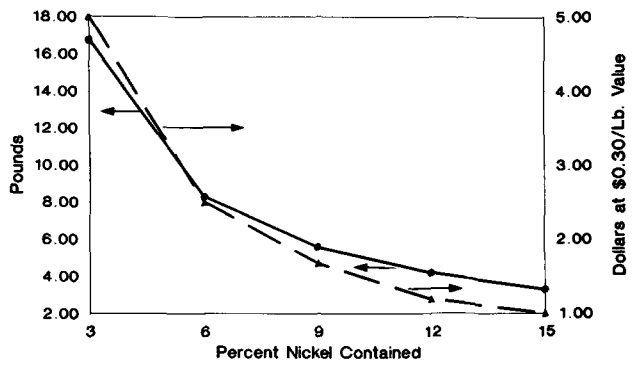

FIG. 5. Spent catalyst disposition. Pounds and dollars of oil loss per pound of nickel at varying nickel concentrations.

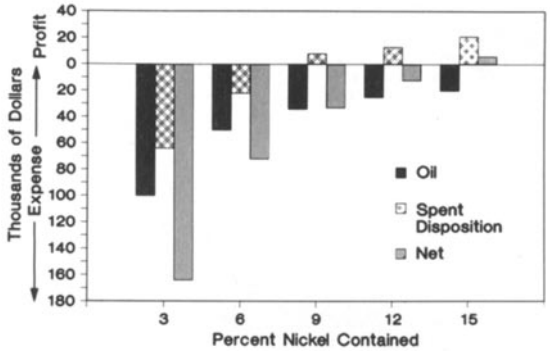

FIG. 6. Spent catalyst economics for 20,000 pounds of nickel at various concentrations. Basis: $5.00 per pound of nickel and $0.30 per pound of oil.

of 9% nickel versus 3%, produces a swing of $129,000. Increasing a 6% nickel concentration to 12% calculates to a swing of $59,600.

These numbers do not include current disposal expense or filter aid cost savings. Also, I have not even attempted to put a price tag on the potential future liability of either landfill or waste site storage. These certainly would be macro numbers, dwarfing the significant economics I already have mentioned.

Rightly or wrongly, the general public regards industrial pollution as a major contributor to environmental problems. In this particular case, the facts show that fats and oils hydrogenators can not only forestall possible public criticism and eliminate potential future liability, but also do it at a profit. Such opportunities do not come along very often.

How to work with regulatory agencies

The following article was written by Ron L. Moeller of Cargill Inc. who has served as chairperson of the National Soybean Processors Association (NSPA) Technical Committee for the past five years.

During the past 10 years, I have been a member of various NSPA Technical Committee subcommittees which have negotiated and worked with (a) the U.S. Environmental Protection Agency (EPA) on New Source Performance Standards for solvent extraction crushing plants; (b) a state EPA on photochemically active hydrocarbon emissions; (c) a state EPA setting hydrocarbon emission limits under the Toxic Substance Control Act (TSCA), and (d) the Occupational Safety and Health Administration (OSHA) on setting dust and other standards for soybean crushing facilities. My sense is that these activities were beneficial both to the agencies and to the domestic soybean crushing industry—a win-win situation.

NSPA approaches these activities with a four "C" concept: commitment, collaboration, communication and complexity. Let's start with complexity. Life in the regulatory world is too complex. We all must strive to make it simpler, reduce the paperwork, and make progress easier and less costly to achieve. There are three cost elements in dealing with regulations. These are:

- The cost to gain an understanding of the regulation, including legal interpretation.
- The cost to make the physical changes necessary to comply.
- The cost to put procedures in place to ensure compliance.

In our judgment, both parties—the regulatory agencies and trade associations—must work to simplify "regulatory adherence." We are not saying to thwart it, but rather to make it simpler and less costly.

The second "C" is commitment. NSPA has demonstrated a commitment to adhere to regulations, but ones based upon technical fact, not political emotionalism. We want to make this country a better place in which to live and work and to raise our families. It is not our intent to be obstructionists. However, we

hope that reason and technical correctness prevail.

The next "C" is communication. There needs to be open, factual communication between the two groups. Communication permits the effective exchange of information and promotes better understanding. It allows the exchange of ideas, perspectives, needs and concerns. It builds trust and credibility. It helps achieve the objectives faster, and with less effort.

The last and perhaps the most important "C" is collaboration. It is our conviction that collaboration in setting and adhering to the standards should be done jointly with the regulatory agencies. We both have a job to do and have a common commitment to make things better where warranted. More progress can be made more rapidly without having an adversarial relationship. More and better information can flow between the two groups. One group can educate the other, and vice versa. A synergetic phenomenon occurs whereby more progress is made collaboratively than separately for the same individual effort or involvement.

Another positive aspect of collaboration is education. Both the trade association members and the regulating agencies can learn about each other's problems, processes and procedures. This is healthy, with each realizing the other has a job to do and acting accordingly.

Complexity, commitment, communication and collaboration are the four "C's" of effective trade association and regulatory agency relations. A climate of mutual respect, factual information exchanges and joint understanding will result from this relationship. We believe NSPA has demonstrated the truth and value of this approach, and we plan to continue this behavioral pattern.

Oilseeds: U.S. share still declining

A major question asked at the U.S. Department of Agriculture's (USDA) Agricultural Outlook Conference in November was "Can the U.S. recover lost shares in world markets?"

U.S. share in world oilseed trade is steadily declining, according to USDA figures. The U.S. share of world trade in soybeans and products dropped from 73% to 56% between 1979/80 and 1987/88 and may fall to 40% this year, USDA's Philip Mackie said. USDA estimated 15.4 million metric tons (MT) of soybeans, 4 million MT of soybean meal and 600,000 MT of soy oil will be exported by the U.S. in 1988/89.

These declines have made the U.S. a residual supplier, Mackie said. Although U.S. exports of soybeans and products will be down about 30% from 1987/88, the drop will be nearly offset by increases from South America so that overall world trade in soybeans and products will be down only 4% from last year, he said.

Mackie posed these rhetorical questions: How soon and how fast will the U.S. be able to recover from the sharp fall in world market share which it expects this year? How will the U.S. do it?

The only way to reverse the downward trend in U.S. soybean production and exports is to change U.S. farm policies, according to industry leaders who spoke at the conference. "Each year that passes without a policy change allowing U.S. soybean farmers to respond freely to market signals is likely to cause further deterioration in the industry's relative position," Alan Tennessen, Cargill's vice president of international trading, said.

Tennessen blamed the soybean loan policy and the impact of other commodity programs for the erosion of the domestic soybean industry and the decline in the U.S. world market share. "A sharply higher soybean price floor gave aid and comfort to Southern Hemisphere soybean production. And escalating target prices for corn and other crops overwhelmed market forces to bid land away from soybeans and sunflowers in this country," Tennessen said.

Although U.S. production and acreage have declined steadily since 1979, there has been vigorous growth in world soybean output, particularly in South America, Tennessen pointed out. Earlier U.S. programs have aided that growth, and the Disaster Assistance Act of 1988 may do the same, he said.

Even though the act gives growers greater flexibility in shifting acreage from target-price crops to soybeans and sunflowers, its 115% price protection provision probably is viewed even more favorably by South American farmers than by U.S. farmers, he said. "Producers in Brazil and Argentina perceive the U.S. government as being committed to keeping soybean prices above $5.50 in 1989-90," Tennessen said. "The U.S. guarantee enables South American farmers to make their expansion plans with greater confidence and aggressiveness."

Meanwhile, the American Soybean Association's (ASA) Stanley Pendlum called the rapid decline in U.S. share in world export trade "alarming." The accelerated share loss has been magnified by the fact that world export volumes have

continued on page 180