FROM WASHINGTON

Fat substitutes pose feed problem

The National Renderers Association (NRA) has told the U.S. Food and Drug Administration (FDA) that approval of olestra and other fat substitutes could have an adverse effect on the livestock feeding and rendering industries.

The approval of fat substitutes in french frying and similar food preparation procedures could mean the livestock industry might lose a major source of low-cost feeding fat now used in high-energy feed for poultry, hogs, cattle and sheep, NRA said. The source of much of the fat used as feeding fat comes from fast-food restaurants.

In comments filed with FDA, NRA President Dean Specht contended that even a "reasonable percentage" of olestra introduced into french fryer use "would sharply reduce the calories in feeding fat processed by renderers and make it worthless." He pointed out that there is no practical way to separate olestra from natural fats and oils. The chemical separation techniques available are too expensive for a livestock feed ingredient and would price it out of the market, Specht said. Details: *Food Chemical News,* April 3, 1989, pp. 23–24.

Firm asks for OK for alternates

Loders Croklaan Inc. has asked the U.S. Food and Drug Administration (FDA) to allow the use of food-grade stearic acid in the production of cocoa butter substitutes if the agency affirms that cocoa butter substitutes made from safflower and sunflowerseed oil are generally recognized as safe (GRAS). Fuji Oil Ltd. has petitioned for such affirmation.

Loders Croklaan wants FDA to permit "the use of food-grade stearic acid as an alternative to ethyl stearate as a feedstock and the use of acetone as a solvent in the fractional crystallization of 1,2-distearoyl-2-oleine (stet)." The company said it had developed a viable, safe process to produce a 1,3-distearoyl-2-oleine (stet) from food-grade stearic acid that is essentially the same as that produced from sunflowerseed oil. Details: *Food Chemical News,* April 3, 1989, pp. 44–45.

SAFETY

Let's provide safe confined-space entry

In the following article, Harold J. Sandvig explores the hazards of contained-space entry and suggests ways to avoid such hazards. Sandvig, who is vice president and corporate safety director for Cargill Inc., serves as Associate Editor for JAOCS *News for Safety and Environmental Issues.*

In the fall of 1986, a captain and his mate died while inspecting a cargo of soybeans on a ship anchored off the coast of Spain. Last June, a seaman collapsed in the hold after being asked to inspect the condition of a cargo of beans as the vessel lay waiting to discharge at a Mediterranean port. A would-be rescuer also died. It didn't end there: two other people died when they attempted a rescue.

Inspecting a hold on a 46,000-ton cargo of soybeans may not sound like a confined-space topic. Or, is it? Each of the holds in these incidents contained 300,000 to 400,000 bushels of soybeans, not unlike the large steel storage bins used by a country grain operation or a soybean facility. We probably wouldn't consider such large storage bins confined space either. But, why not? What is the definition of confined space?

I define confined space as any space or location with limited openings for entrance and exit which could have limited natural ventilation and an unfavorable air condition not intended for continuous employee occupancy.

A 60,000 deadweight ton (DWT) ocean-going vessel with large open hatches doesn't seem to meet the definition of confined space; neither does a 500,000 or 1 million bushel grain tank. Most of the time, that perception is correct. However, it isn't always. In the case of the four dead seamen, the ship had been enroute a long time after loading in South America and had been anchored in the port for 24 days. Entrance for inspection was made through a manhole with the hatch closed; there was no forced ventilation of the type common in a large grain storage facility.

As a rule of thumb for safety, entry into a tank, vessel or other confined space without self-contained breathing apparatus (SCBA) is acceptable provided the work environment contains at least 19.5% oxygen. Although the hatches had been open for three to four hours on that ill-fated vessel, the ambient air in the hold was still only 16% oxygen. These people didn't die from toxic chemicals introduced through pesticides, herbicides or grain treatment; they suffocated because of insufficient oxygen, an unrecognized hazard.

Dozens of lives are lost and many more serious injuries occur annually because individuals enter

a confined space without recognizing the hazards. Less than eight months ago, an individual working at a tank-truck wash plant jumped in to clean a tank wagon which had previously held an innocuous feed supplement and was overcome. His partner went in to rescue him; both lost their lives. Such accidents don't have to happen, but they do. They occur for a number of reasons. I have already named a primary reason: a hazard was not recognized. Other causes of serious injuries and deaths would be:

- lack of established procedures.
- an attempt to save time.
- poor judgment (sometimes associated with a lack of training).
- lack of communication.
- disregard of established procedures.
- improper assessment of operational readiness.

The potential for a confined space-related accident often involves a multiple of these items; there seldom is a single cause or reason. For example, a worker gets into a large agitated chiller to clean it out and someone turns it on. Another example is an actual incident in which two young employees entered an air-purged extractor to clean out a pocket of white flakes during a normal shutdown. It is suspected they deliberately sniffed residual hexane from the flakes to cause a mild high. Too much of that euphoria and only one got out alive.

The first of these two examples shows the need of a lockout/tagout system for entering a confined space. The second shows a need for better training which includes insistence that employees follow prescribed procedures. These experiences lead to one conclusion: a structured confined-space entry program for all workplaces is a must. Industry—those who know the business and can recognize the potential hazards—must design and manage the program. It has to be simple enough to implement, yet rigid enough to avoid shortcuts.

Although the Occupational Safety and Health Administration (OSHA) is working on a confined-space regulation with guidelines for program implementation, this is such a serious issue that every industrial facility should have a confined-space entry program now; there's no need to wait. It is likely operators in the fats and oils industry already have programs in effect. If not, here is a sample program to consider.

First, the program should be divided between the known and unknown. When we know what to expect, a procedure is written to com-

plement the confined-space entry permit program. When working under unknown or emergency conditions (such as unplugging an ingredient bin or making emergency repairs on an extractor or reactor), it is necessary to use a check-and-balance system. This can be a permit authorization requiring the involvement of a higher authority than local operations or engineering management.

A confined-space entry program has to deal with the unexpected and often includes an equipment lockout/tagout program. Entering a rotating vessel that has been locked out or a mixing tank with the agitator locked out may also require other safeguards to ensure that the vessel won't roll or the agitator won't rotate unexpectedly. For instance, a hydraulic or pneumatic system that hasn't been bled down and holds a valve or gate and cylinder in position has the potential to slam shut on the mechanic's hand as he removes the last bolt or to dump a hazardous liquid into the mixer.

An important step would be to draw up a checklist that addresses recognized potential risks. This often takes the form of a confined-space entry permit (Fig. 1). Such a permit should be issued after it is confirmed that entering the confined space is the only way to accomplish the task. Management's first objective should be to avoid having employees enter a confined space. If entrance is unavoidable, a permit should be used to ensure the following:

- the right people, properly trained, do the job.
- all required safety gear, tools and personal protective equipment have been provided.
- environmental conditions (temperature, toxicity, oxygen content) are such that personnel can safely enter with or without SCBA.
- employees and supervisors understand the responsibilities and risks of the task.
- work methods and procedures are carefully considered and implemented in the safest possible manner.

Loss of life through entering confined space has resulted from not recognizing the hazard or choosing not to recognize the hazard, i.e., entering a bin or tank that has material hanging on the side and overhead, rat-holed or bridged material, nonventilated air-deficient tanks or improperly locked-out equipment.

It is management's responsi-

Division/Subsidiary: _____ Plant Location: _____

Date: _____ Time _____

Confined Space To Be Entered: _____

Location: _____

Work To Be Done: _____

_____

Permit Expires: _____

Pages PS-7 through PS-9 of the Corporated Safety Policy and Procedure Manual, outline policy and procedures for confined space entry. This permit is necessary for entrance into any confined space.

PRECAUTIONS TO BE TAKEN

☐ Confined space entry permit obtained.
☐ All personnel trained in:
  Safe and proper entry procedure — Yes ___ No ___
  Use of emergency breathing apparatus — Yes ___ No ___
  Use of safety equipment — Yes ___ No ___
  Training documented — Yes ___ No ___
☐ Personal inspection of entry site by person issuing permit.
☐ Cutting and welding permit issued. (only if required)
☐ Space adequately cooled. — Record Temp. ____°
☐ Controls locked out or disconnected.
☐ Internal movable parts properly secured.
☐ Pipes and lines disconnected, or blind flanges installed.
☐ Manholes large enough to permit rescue.
☐ Rescue team trained. — Yes ___ No ___
  Training documented — Yes ___ No ___
  Rescue equipment maintained and available — Yes ___ No ___
☐ Atmospheric monitor calibrated. Date of calibration: _____
☐ Atmosphere checked for safety:
  Oxygen greater than 19.5%: Yes ___ No ___ Reason: _____
  Toxic gases present: Yes ___ No ___ Reason: _____
  Combustible vapors less than 10% of the lower flammable limit: Yes ___ No ___ Reason: _____
  If no to any of the above, has the Superintendent/Manager been notified? — Yes ___ No ___
☐ Results of all tests recorded. — Yes ___ No ___
☐ Adequate ventilation.
  Internal atmosphere monitored — Yes ___ No ___
☐ S.C.B.A. or approved airmask used for entry. — Yes ___ No ___
  Documentation of training if yes to above. — Date _____
☐ Portable lights suitable for atmosphere and adequately supported.
☐ Observer trained and assigned. Name _____ Date _____
☐ Means to communicate and to summon rescue team.
☐ Safety gear worn by those entering confined space.
☐ Division Operations notified - person contacted: _____

Under no conditions are men to work below top of material in bin.
The precautions checked have been taken to ensure employee safety on this job.

SIGNED: DATE: _____

Employee | Employee | Employee

Supervisor Responsible | Plant Manager/Superintendent

FINAL CHECK

All personnel are out of confined space. All equipment and materials used in this work have been removed from confined space and it is ready for use.

SIGNED: _____ DATE: _____
Supervisor

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FIG. 1. Example of a confined-space entry permit.

SAFETY

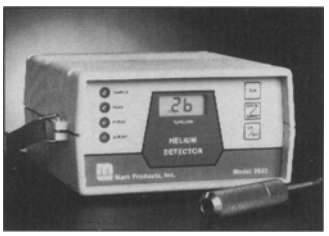
bility to examine and eliminate conditions and circumstances that require employees to enter confined spaces. This can include training employees to perform their tasks properly and to recognize the risks of entering confined spaces. It also means instituting measures to rigidly control the authorization of confined-space entry and to ensure that safe working procedures are in place when confined space is part of the employee's task. If the work isn't routine, it means involving the appropriate level of authority in decision-making.

Finally, retraining and frequent review of safe working procedures for confined spaces are absolutely essential. As managers, we must review why entering confined space is necessary and search for ways that eliminate confined-space entry. Secondly, management must be satisfied that the task is not becoming so routine that subtle changes in procedures are allowed to creep in, overshadowing the reason confined-space entry procedures were established in the first place—that of employee safety.

Lastly, if something unforeseen occurs and an employee is trapped in a confined space, management must be able to answer the following questions: How should rescue be made? Who should do it? What is the procedure?

Experience tells us that accidents resulting from confined-space entry, including those with deficient lockout programs, are leading causes of death within our industry and related businesses. Working in confined spaces is serious business.

NEW PRODUCTS



HELIUM DETECTOR

Marks Products' portable Model 9822 helium detector is designed for onsite use in closed, pressurized and vacuum piping systems. It has a sensitivity range of 0.01 to 100% helium. Features include a large LCD display, an extendible probe, 12-volt gel cell battery and battery charger. Contact: Mark Products Inc., 575 North Pastoria Ave., Sunnyvale, CA 94086.

GREASE

Accurate Chemical & Scientific Corp. offers a vacuum-resistant, chemically stable lubricating grease for ground joints, stopcocks and apparatus without dripping points. Glisseal is insoluble in water and low molecular mono- and polyhydric alcohols and is designed to have a constant lubricating consistency between −40 and +250°C. It contains no silicon and is resistant to most acids, alkalis and gases. Contact: Accurate Chemical & Scientific Corp., 300 Shames Dr., Westbury, NY 11590.

KJELDAHL SYSTEM

CEM Corp. offers a high-speed, microwave Kjeldahl digestion system to measure protein levels in whey, milk, cheese and all types of liquid and dry dairy products. The CEM-Kjel-FAST is designed to complete sample digestion in six minutes. A built-in fume scrubber and programmed reactant addition are standard features. Contact: CEM Corp., PO Box 200, Matthews, NC 28106.

COLOURSCAN

The Tintometer Co. has introduced the Lovibond Colourscan, a computerized color measurement system for the analysis of liquid samples. The Colourscan measures color by transmission using the CIE color system. It accommodates a six-inch cell pathlength. Contact: The Tintometer Co., Busch Corporate Center, 309A McLaws Circle, Williamsburg, VA 23185.

HPLC PUMP STATION

The IBF pump processing unit 260, a microcomputer-controlled HPLC pump by IBF Biotechnics, provides preprogrammed control for flow rate regulation, gradient control, fraction collection, pump or valve injection, column switching, parameter assignment and detector remote control. The unit offers flow rates from one to 1,000 milliliter/minute and can be equipped with one or two pump circuits that can be operated individually, in series or in combination. Contact: IBF Biotechnics, 8510 Corridor Rd., Savage, MD 20763.

TEMPERATURE CALIBRATOR

Jofra Inc. has released two new models—601 and 602—in its "600" series of dry block temperature calibrators. The units function in a range from ambient temperature to 1100°F, and allow calibration of RTD, thermocouples, filled bulbs, temperature switches and controllers without the use of sand or dangerous liquids. Contact: Jofra Inc., 67-55 Woodhaven Blvd., Rego Park, NY 11374.

SPECTROMETER

Thermo Jarrell Ash's AtomComp 81 spectrometer is designed to measure trace elements in parts-per-million levels. It is operated from an IBM System 2 microcomputer running ThermoSPEC software. The software includes Enable, an integrated word processor, database manager, spreadsheet, graphics and telecommunications package. Contact: Thermo Jarrell Ash Corp., 8E Forge Pkwy., PO Box 9101, Franklin, MA 02038-9101.