Inspections, Compliance, Enforcement, and Criminal Investigations

New Source of Lead and Other Contamination

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DEPT. OF HEALTH, EDUCATION, AND WELFARE PUBLIC HEALTH SERVICE FOOD AND DRUG ADMINISTRATION *ORA/ORO/DEIO/IB*

Date: 6/18/74 Number: 17
Related Program Areas:
Various Foods and Drugs

ITG SUBJECT: NEW SOURCE OF LEAD AND OTHER CONTAMINATION

Part I

The current fuel crisis has created a potential problem area which could have broad ramifications in the field of food and drug manufacturing.

During a recent inspection it was learned that a food additive manufacturer had discovered 20-25 ppm lead in calcium propionate, a mold inhibitor which they had manufactured. Raw ingredients analysis revealed that the source of the contamination was calcium oxide.

Calcium oxide or "Quicklime" is produced by roasting calcium carbonate (limestone) in kilns, utilizing a direct flame method, until all of the carbon dioxide is driven off. In this case, the calcium oxide producer had been unable to obtain sufficient quantities of natural gas, the normal fuel, and was forced to use #2 diesel fuel. When even this fuel became scarce, a supply of fuel oil said to be equivalent to #3 diesel was purchased and blended with #2 diesel to obtain the required viscosity for proper combustion in the firm's kilns. The fuel oil was later found to be reprocessed motor oil and thus contained tetra ethyl lead.

Calcium oxide and calcium hydroxide, which is produced by the action of water on calcium oxide, have a broad range of uses in the food industry which include the following:

Calcium Oxide	**Calcium Hydroxide**
Alkali	Buffer
Nutrient	Neutralizing Agent
Dietary Supplement	Firming Agent
Dough Conditioner	
Yeast Food	
Bleaching Agent	

To meet Food Chemicals Codex standards CaO and Ca(OH) 2 must contain not more than 10 ppm lead.

The potential for lead contamination could be present in any manufacturing procedure which uses a direct flame process and has changed fuel suppliers without determining if the fuel meets their specifications.

Ed. Note: We are pleased to present the foregoing as the first ITG written by district personnel. This very timely topic stimulated additional comments which we take the liberty of adding below.

----*DEIO/Investigations Branch HFC- 132*

Part II

Additional examples of direct-fired processes wherein changes in fuel may lead to contamination are processes utilizing:

Rotary driers Grain driers Smoke-curing units Vermiculite poppers Certain equipment in by-product plants.

When gaseous hydrocarbon fuels are mixed with air prior to ignition, the hydrocarbons and oxygen form hydroxylated compounds which convert to aldehydes; additional heat and oxygen convert aldehydes to H 2, CO, CO 2 and H 2O. Thus product processed before the combustion chamber is thoroughly hot, or processed with a "lean" fuel ratio (a short, blue, non-luminous flame) may become adulterated with aldehydes.

All No. 6 (or Bunker C or PS400) and No. 5 fuel oils contain appreciable amounts of vanadium. All fuel oils which require heating, either in the storage tank or at the burner may be assumed to be either No. 6 or No. 5. Fuel oils fror Venezuelan fields contain high amounts of vanadium. Any products produced by direct firing with these heavy fuel oils are subject to possible contamination. In such cases, it is appropriate to determine firms' procedures to test for presence of vanadium. Blackstrap Molasses is used infrequently for direct firing and is quite high in potassium content. Its use may lead to contamination with substantial levels of potash (KOH).

Some coals used for direct-firing may lead to contamination of products with H 2S and SO 2. Direct firing with petroleum coke may lead to contamination with vanadium, H 2S, SO 2 and various thiosulfates. Bagasse (crushed sugar cane stalks) is used in selected areas for direct firing and may result in contamination of products with potash (KOH).

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