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Second in series . . .

FDA's 0.06 Per Cent Lead Limit: Is It Based on Fact or Fancy?

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Senior Editor

HERE'S THE SITUATION. A prominent senator from an opposition party is sitting on a potential hot issue relating to lead poisoning and he's evidently going to milk it to the limit. He sets a hearing for a Thursday to consider amending a law known as the Lead Paint Poisoning Prevention Act.

You're a party strategist, and your job is to grab the play away from the opposition. You have a trump card: The Food and Drug Administration, controlled by your party, is charged with administration of the Federal Hazardous Substances Act, under which lead limits in paint can also be controlled.

What do you do? You strike first, even if it means violating all the rules of the game.

In essence, that's the scenario for the recent suprise ploy whereby the FDA on Friday, March 10 — one day after Senator Edward Kennedy of Massachusetts held hearing on the subject — issued a regulation setting a two-stage limitation on lead content in paints that are sold in containers that could eventually end up for household application.

Now, what about violating the rules of the game?

The FDA itself had set a deadline for submitting information to help set its standards — April 8, three weeks after the day it issued its fiat. The rules weren't meant to work that way.

Knowledgeable people in FDA were reported to have objected to imposing the low lead levels sought by Senator Kennedy's committee. Was the switch instigated from on high?

Is this another manifestation of the definition of politics as the art of the possible? And are slum children, black, brown, yellow and white, pawns in the play for power?

The cliffhanger in this scenario is: Will Ted really do something practical to get funds for solving the real problem — safeguarding slum children from 50-year-old lead laden tenement walls? And will Richard figure a way to take the ball away from Ted?

While we wait for next week's episode in the current farce series, let's examine the facts and theories behind the various lead limits that are under discussion for coatings.

Several weeks of study (within the limits of a non-existent medical education) have shown that the claims of the authorities that lead limits should be controlled have some foundation.

Dismissing their claims as arrant nonsense is as foolish as accepting them at 100 per cent face value.

But you can't fight 'em if you don't understand what they're trying to say, and why.

So far, the opposition to official claims has been distinguished by pained reaction to what it will mean to "the small manufacturer." Very little has been said about the claimed facts.

This article will try to present the facts, according to the American Academy of Pediatrics, which presented the technical basis for Senator Kennedy's case, and the spotlight-grabbing play of the clever FDA.

Blood Limit of Safety

The actual facts, as distinguished from the claimed facts, are that Dr. R. A. Kehoe of the University of Cincinnati did pioneer work in determining toxic blood-lead levels. Working with adult human subjects in actual feeding tests, he determined that 80 micrograms of lead per 100 grams (or milliliters) of blood was the upper limit of safety.

The second fact is that the National Academy of Science, with the collaboration of Dr. J. Julian Chisolm of Johns Hopkins University Medical School, a highly regarded pediatric researcher and scientist, decided, after further exhaustive studies, that 80 micrograms was too high a level for safety. The Academy said 40 micrograms should be the limit.

And why 40 micrograms? Because that's the blood-lead level which, when exceeded, is accompanied by a marked increase in the urinary level of delta amino levulinic acid, a blood component.

That doesn't mean that children get sick the instant the blood-lead level climbs to 41 or even 50 micrograms. It's the point where a surge in ALA occurs after each increment of lead.

So, why is increased ALA so bad? Well ALA is supposed to be converted by an enzyme, ALA-dehydrase, to porphobilinogen, which is involved in p duction of hemoglobin. Lead blocks enzyme's action, and the unused A builds up in the blood and ends flowing away in the urine.

So 40 micrograms of lead per gr of blood, the point where ALA beg to increase rapidly in the urine as m lead is added, is the upper limit safety, according to the National Ac emy of Sciences.

Rather than try to fight that aug body, try fighting City Hall—and know where that got us in Chicag

Granted that 40 micrograms is the gospel, let's see how they came with 0.06 per cent of the dried p film as a permissible level.

The logician who helped reach t conclusion is Dr. Barry King of U.S. Public Health Service, Cincinn Information developed by Dr. King others caused the American Acade of Pediatrics to hold that total lead take of children should be limited 300 micrograms of lead a day, wh is one-half of the 600 micrograms Dr. Kehoe felt was safe for adults a his study.

Now, we must remember that of 300 micrograms of permissible inta about 150 mcgms. are normally ta into the system from food, air water. Therefore, the child only another 150 mcgms./day margin for dulging in paint ingestion.

How Logical Is Research?

Dr. King painted some surfaces w a variety of lead-containing paints came up with several interesting fa For example, one square centimeter six coats of paint film weighs 40 m grams. Using six and 10 coats as p sible chip depths, he worked out a ta showing the contributions of lead the diet of children. (See Market S tion for complete table.)

He found that six coats of paint w 0.1 per cent lead, taken in 1 sq. sections, yielded 40 mcgms. of le With 0.05 per cent lead, the contri tion would only be 20 mcgms./sq.cm

But there are 6.25 sq. cms. in

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square inch, so we multiply this by 20 mcgms. and we get 125 mcgms., which is 25 mcgms. less than the 150 mcgm. intake per day regarded as safe for maintaining the blood level at 40 mcgms. per gram of blood.

So, we've revealed the logic behind 0.06 per cent lead.

How logical is this logic? Dr. Jerome F. Cole, director of environmental health for the Lead Industry Association, who got his doctorate at Cincinnati under Dr. Kehoe, challenges the claim that a child ingesting paint will absorb lead at the same rate that Dr. Kehoe's adult subjects did. Dr. Kehoe fed lead salts, nitrates, acetate, and chloride — in aqueous solutions, which are undoubtedly more readily taken into the human system than paint chips, which have their lead particles encapsulated in a relatively insoluble binder.

And now, for the purpose of the law, these encapsulated lead particles are rated as being as readily soluble as lead salts in an actual solution.

Certainly, the paint industry has a strong case for challenging the validity of that claim. Medical authorities would, no doubt, testify against this rather far-fetched assumption.

If that seems too easy, lead-feeding tests on primates will very likely prove what appears an obvious error of judgment. One researcher outside of New York has already done one primate feeding test using lead-containing paint chips; he has reason to believe that the assumptions about the equal solubility of encapsulated paint chips and aqueous lead salt solutions are significantly erroneous.

We can take this political man handling lying down, or we can fight—with facts.

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Plastics Engineers Plan May Conference —Technical Program Announced

Greenwich, Conn., March 21 — The Society of Plastics Engineers' advance program for the 30th Annual Technical Conference, "Shaping the Future with Plastics," lists 167 symposia, panel discussions and papers to be presented at Chicago's Palmer House May 15-18.

Thirty-four educational sessions will deal with color and appearance, polyolefins, thermosetting molding, plastics analysis, reinforced plastics, ecology, analysis, electrical and electronics, engineering and structure, injection and rotational molding, vinyl, automotive uses, extrusion, blow molding, weatherability, thermoforming, and stabilization of plastics.

Over 20 technical displays will exhibit plastics production instruments, processes, laboratory and programming equipment, and other technical elements. Representatives from the U.S. Department of Defense's Plastics Technical Evaluation Center will be on hand to show how the Center locates, gathers and disseminates information. Other displays will feature the testing of plastics and composites, a laboratory extrusion setup, the use of radio frequencies to generate drying heat, PVC compounding, injection-molding programming, controls and monitors.

Exhibitors will include Phillips Petroleum Co.; Tenneco Chemicals, Inc., Intermediates Division; Ferro Corporation; CO_2 Consultants; The Rainville Co., Inc.; Conair, Inc.; Midland-Ross Corporation; Application Engineering Corporation; MTS Corporation; Batson Machinery, Inc.; Improved Machinery,

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THE MARKETS

Vegetable Oils

NEW YORK, March 23 — Any hope for an early decline in soybean oil prices to levels attractive to resin buyers was dashed when bullish enthusiasm was fired by intentions-to-plant reports issued last week.

Then, it became apparent that acreage this year will be below USDA expectations.

Nonetheless, stocks of soybean oil are reported to be accumulating in this country, with the outlook for exports rather poor.

Other oils were quiet. Castor oil stayed at a high 19¼ cents; oiticica was a low 14½ cents; and tung oil was around 11¼ cents.

Sales of those oils were at their usual rate.

Nothing further has been said about tightness in tall oil, although indications are that better grades of tall oil fatty acids are snug.

Miscellaneous Materials

NEW YORK, March 23 — The prospects for lead driers right now look bad, at least as far as architectural paints are concerned.

It has been felt for some time that if the limit on lead is put at 0.5 per cent by dried weight of film, lead driers could be used. Below that, it doesn't seem feasible. The National Academy of Health has established that 150 micrograms of lead a day, beyond the 150 mcgms. believed to be ingested by everyone each day, is all that can be permitted in the amount of paint a child is likely to pick up from chips. The Academy also figures that six or 10 coats would be on the chips (which would be peeling in 30-50 years). So, they came up with the following figures:

Calculated Lead Content of Paint Chip With One Sq. Cm. of Exposed Surface

No. Layers	Ave. Wt. of Paint Chip	Per Cent by Weight	Amount Micrograms
1	6.5 mg.	1.0	65 mcgms.Pb
6	40.0 mg.	1.0	400 mcgms.Pb
10	65.0 mg.	1.0	650 mcgms.Pb
1	6.5 mg.	0.1	6.5 mcgms.Pb
6	40.0 mg.	0.1	40.0 mcgms.Pb
10	65.0 mg.	0.1	65.0 mcgms.Pb
1	6.5 mg.	0.05	3.2 mcgms.Pb
6	40.0 mg.	0.05	20.0 mcgms.Pb
10	65.0 mg.	0.05	32.0 mcgms.Pb

Since each sq. cm. is one/6.25 inch, multiply the figures in the right column to get the lead content per sq. inch. Thus, six layers of 0.05 per cent lead multiplied by 6.25 yields 150 micrograms per sq. inch, or the maximum allowable under the Academy's figures. Read the article (page 38) on the background of the lead situation, and this will take on more meaning.

Flaxseed

Foreign Flaxseed and Linseed Oil

Following are recent quotations for shipments of flaxseed:

Canadian flaxseed, Fort William, $2.78.
Rotterdam, ex-tank, $185.

Marine Oils — New York

Crude—			
Menhaden High Iodine, tanks			
F.o.b. plant E. C.	lb.	.. —	..
Segregated Crude, N.Y.C.	lb.	.09 —	..
Processed—			
Light pressed, tanks, N.Y.	lb.	.10½—	..
L.c.l., New York	lb.	.18½—	..
Alkali, Refined, tanks, deliv., N.Y.C.	lb.	.11¼—	..
L.c.l., New York	lb.	.13¼—	..
Kettle bodied, tank			
X-Y	lb.	.1305—	..
Z-21	lb.	.1345—	..
Z-2, Z-3	lb.	.1405—	..
Blown, Z-3 to Z-7, bodied, tanks	lb.	.11¼—	..

*Nominal.

Vegetable Oils

Castor Oil, f.o.b. N.Y.C.			
Dehydrated, tanks, C-H	lb.	.17 —	..
Dehydrated, tanks, Z-3	lb.	.. —	..
Blown, 10 drums f.o.b. N.Y.C.	lb.	.30 —	..
California 3¼e more			
Imported No. 1 tanks	lb.	.19½—	.19¾
No. 3, tanks	lb.	.19 —	..
Coconut Oil, f.o.b. N.Y.C.			
Cochin-Refined	lb.	.11 —	..
Linseed Oil, Minneapolis,			
Raw, tanks, f.o.b.	lb.	.09 —	..

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