Questions from industry and other interested groups, submitted through Ag and Food, get Answers from W. B. Rankin, assistant to the commissioner of FDA

Does FDA presently have sufficient laboratory facilities for residue analyses and are the analytical procedures accurate enough to determine whether the product has an excessive residue?

FDA has sufficient laboratory facilities to make residue analyses on numerous samples; the facilities and manpower are not adequate to permit the amount of spot checking that is desirable.

Good, accurate analytical procedures are available for many pesticides. Improved procedures are needed for several others.

Where products are in intrastate commerce only and the state health department has no laboratory facilities for residue work, has the FDA established any liaison with state health departments for handling these samples or will it be left entirely to the state officials?

FDA will give all possible laboratory assistance to the States in case of emergencies. Since its facilities are inadequate, this assistance cannot serve as a substitute for State laboratory facilities.

Based on known toxicity for certain pesticides, is it not possible that the establishment of a pharmacological zero tolerance or other ratings would be more practical from the standpoint of the general enforcement of the residue problem?

"Pharmacological zero" evidently refers to a level of no harmful effect. (Theoretically any concentration of a chemical may have some slight effect, so pharmacological zero is not a good designation.) Thus the question really is: wouldn't it be better to set tolerances for some chemicals by procedures other than those of the Miller Bill? FDA can't do this because the law doesn't authorize it.

When adequate research shows that no residues remain on a crop, it is proper to establish a zero tolerance for the pesticide on that crop. Some manufacturers have withdrawn a petition rather than have a zero tolerance under these circumstances. But they find it difficult to get States to recommend use of a chemical that has no formal status under the Miller Bill. Perhaps the best solution is for manufacturers to permit zero tolerances to be established under these circumstances; the order in the *Federal Register* will show why the zero tolerance is established, and States will know that the product has been considered under Miller Bill procedures.

Residue tolerances have been established on meat for a few insecticide materials. Will such residue tolerances be subject to possible modification when more adequate methods for determining residues on various meat animals have been developed?

Any tolerance may be modified if new facts show the need for change. [See Section 408 (m) of the Federal Food, Drug, and Cosmetic Act.] Tolerances have been established for only one pesticide in meats, methoxychlor; we see no need for a change in these.

To what extent will the establishment of residue tolerances on meat for a given pesticide have on already established tolerances for the same pesticide on forage crops, grain, and other materials which might be consumed by the meat animal?

The tolerances on meat will not affect established tolerances. If the consumption of feed containing a permitted residue gives residues in meat, FDA will establish an appropriate tolerance on meat when it sets a tolerance on the feed crop.

What procedures will be set up for establishing tolerances of insecticide residues in meat products, poultry, and eggs? (It is my understanding that milk will be in a separate category inasmuch as no tolerance will ever be established for any contaminate in milk.)

This question may well be broadened to include forage and milk, and in answering it we would like to restrict the comments to chlorinated hydrocarbons since they are the pesticides about which enough facts are available to warrant a definite answer.

When a tolerance is requested for a chlorinated hydrocarbon on forage, sufficient data should be presented to show the exact relationship between the amount of residue on the forage and the amount of residue in meat and milk from animals fed on this forage. This can be obtained by feeding several levels of the insecticide to lactating cows and performing simultaneous fat and milk analyses. The feeding levels should include at least two levels considerably above the requested tolerance on forage.

If the feeding of forage with the requested tolerance level of chlorin-

Chart III. Appeals Available to Petitioner

About certificate of usefulness:

1. Request for public hearing before certificate is issued;
2. Referral to a U. S. Circuit Court of Appeals.

About tolerance or exemption:

1. Appeal to advisory committee before tolerance or exemption is established. (Either FDA or petitioner may request an advisory committee. The committee consists of experts in the subject matter of the petition. The experts are selected by the National Academy of Sciences, and appointed by the Commissioner of Food and Drugs.)
2. Request for public hearing after tolerance or exemption is established.
3. Referral to a U. S. Circuit Court of Appeals.

ated hydrocarbons to dairy animals gives residues in the milk, FDA will not establish a tolerance for the pesticide in forage unless the petition contains evidence that the quantity of residue in milk is safe and FDA simultaneously grants a tolerance for the pesticide residue in milk. If the feeding of forage with a requested tolerance level of chlorinated hydrocarbons to meat animals gives residues in the meat, safe tolerances will have to be established simultaneously for residues in forage and residues in meat.

Since milk is used as the principal food for infants and many invalids, greater evidence of safety will be needed to justify a tolerance for a chemical in milk than to justify a tolerance for the same chemical in most other foods.

When and how will samples of meat be taken for residue analysis?

There is only one tolerance for residues in meat at this time and that is for methoxychlor. It does not matter whether samples for methoxychlor examination are taken from abdominal or subcutaneous fat.

Does the fact that pesticide X has a tolerance of less than 1 p.p.m. necessarily mean the hazards involved in its use are 10 times those encountered in the use of product Y which has a tolerance of 10 p.p.m.? In other words, do the tolerances established in any way accurately reflect hazard or toxicity levels or is it possible that a relatively safe material may have a tolerance of only 1 p.p.m. because no more is required?

If the petition shows that useful employment of the pesticide leaves residues at or slightly below the safe level, the tolerance is established at the level of safety. If the residues do not reach the safe level, the tolerance is based on the amount of residue needed to protect the crop. Thus the tolerances do not necessarily reflect the relative toxicities of pesticides.

Section 120.101 states that the tolerances for pesticides "apply only to residues resulting from their application prior to harvest." Does this restriction apply only to those tolerances established in that particular section? The tolerances for methyl bromide established in Section 120.-123 obviously apply to application after harvest, but does Section 120.103 permit application of captan to the specified raw agricultural commodities after harvest?

The restriction in §120.101 applies only to tolerances established in that section. The tolerances listed in §120.103 apply whether captan is used before or after harvest. If captan is used to retard spoilage of a food in interstate commerce, the food must bear labeling that states it contains an added chemical preservative (see section 403 k of the Federal Food, Drug, and Cosmetic Act).

Will some program be set up to permit clearance for use of established pesticides on crops where specifically recommended by land grant colleges or other equally reliable authoritative sources? Under such a program, will a system be set up to provide for rapid clearance with a minimum of red tape and delay?

A land grant college may apply for a tolerance of exemption in the same way a pesticide manufacturer does. The amendment does not provide a separate program for dealing with these petitions.

The second part of the question is somewhat like: "Have you stopped beating your wife?" Tolerances are set within the time limits the Congress established as proper and reasonable. The administrative procedures followed are those written into the law by Congress. FDA is trying to handle petitions in less time than is provided in the Miller Bill, and has cut down on the time in a number of cases. Further savings of time may be possible when the present backlog of petitions is out of the way.

In the case of less toxic materials which are of the categories obviously not endangering the nation's health, will a program be instituted to relieve these materials from meeting all of the costly requirements now provided under the Miller Bill?

Twenty-five chemicals have been declared safe or have been granted an exemption from the requirement of a tolerance. FDA does not have evidence that other chemicals are equally safe or equally deserving of exemption. If there are other chemicals now recognized by pharmacologists as nontoxic, or relatively nontoxic, FDA will be glad to discuss the facts with an Experiment Station or manufacturer who wishes to recommend the chemical for use on food crops.

What provisions are being made to simplify compliance with the Miller Bill and reduce excessive delays and costly toxicology work?

This was answered in part in the article (see discussion on grouping of crops) and in part in answers to earlier questions.

Does the "burden of proof" as to whether residue on a raw agricultural commodity is in excess of approved tolerances rest with FDA or does it rest with the shipper of the commodity?

It rests with FDA.

What are the chances that any liability incurred for excessive residue would be passed along to the dealer, the distributor, or the manufacturer of the pesticide regardless of the fact that the manufacturer's labels and the literature of the dealers and distributors contain approved directions for use?

This question is on matters outside FDA's field of competence.

Action on certain petitions for tolerances have been extended to March 1. For the first quarter, in the case of these petitions, can the pesticides involved be sold freely before March 1?

Insofar as FDA is concerned the pesticides may be sold.

In cases where it is difficult, if not impossible, to develop a simple and inexpensive analytical method for determining residues in the field, what are the responsibilities and the dangers, etc, for growers and others using pesticides containing chemicals for which no simple analytical methods are presently available?

The growers are responsible for marketing a safe food. If they follow directions on pesticide labels registered by the U. S. Department of Agriculture they should have safe food and testing of the crop before marketing would not be necessary. The availability or non-availability of a rapid field test for high residues has no bearing on the growers' responsibility. Stated another way: It is not dangerous to follow registered labels; deviation involves a calculated risk.

If the only analytical method available is a difficult or expensive one such as a radioactive tracer technique, and assuming that all of the residue figures submitted in a petition

Chart IV. Some Proposed Groupings of Crops

1. Apples, crab apples, pears, and quinces
2. Oranges, grapefruit, lemons, limes, tangerines, tangelos, citrus citron, and kumquat
3. Raspberry, blackberry, dewberry, loganberry, and boysenberry
4. Cantaloupes, muskmelons, honeydew melons, pumpkins, watermelons and winter squash
5. Spinach, beet tops, collards, dandelion, kale, mustard, Swiss chard, and turnip tops
6. Legumes for forage as follows: alfalfa, clovers, soybean hay, peanut hay, lespedea, vetch, lupines, cowpea hay, pea vine hay

[a] (In many cases tolerances may be established on several commodities in a group with considerably less research on residues than would be needed if each commodity were considered separately).

for tolerance are to be based on this method:

1. Would the results be acceptable in establishing a tolerance?

2. Would the lack of an inexpensive and simple chemical method for residue determination prevent granting of a tolerance even though the toxicological results are favorable?

There are two ways of dealing with poisonous pesticides so that the public health is protected. One is to ban the use of the material on crops and the other is to determine what level of residue is safe, set a tolerance for this safe level, and conduct sufficient control tests to determine that the safe tolerance level is being met. The United States has concluded that the second method is proper; the Miller Bill is designed to assist in this type of control.

Obviously, it would be a futile gesture to set a tolerance for a pesticide chemical if there is no analytical method that can be used by control officials.

The radioactive tracer technique of determining residues requires the production of radio-tagged pesticide, its application to the plant and analysis of the resulting crops by radioisotope procedures. This is a useful tool for research purposes but it is impractical for a pesticide manufacturer to market a radio-tagged pesticide commercially. So the research tool is useless for control purposes.

The specific answers to the two questions are:

(1) The residue data obtained by radioactive tracer technique are acceptable in establishing a tolerance provided there is another method of assay available for control purposes.

(2) FDA believes it would be improper to set a tolerance under the Miller Bill unless there is some method of determining what residues may remain. A possible exception would be a chemical so innocuous that analytical procedures are not required to protect public health; an exemption from the requirement of a tolerance should be considered here.

What is the possibility of expediting the field development of new pesticides by issuance of temporary tolerances based on acute toxicity tests and before chronic toxicities are determined? There should be no hazard of chronic poisoning during a two year temporary tolerance period.

It is possible to grant a temporary tolerance provided subacute toxicity studies and histological and pathological examination of tissue from the test animals show clearly that there is no health hazard from the residues that will remain on crops.

Can present tolerances be changed to a higher figure when changes in agricultural practice result in higher residues and toxicological information justifies a higher tolerance level?

Any tolerance can be modified if new facts show the need for change. [See Section 408 (m) of the Federal Food, Drug, and Cosmetic Act.]

When a tolerance has been established on a pesticide will it be possible for the FDA to process subsequent petitions for the same pesticide, requesting tolerances at the same or lower levels on additional raw agricultural commodities in a shorter time than is now required for the original petition?

Generally, yes.

How will FDA establish tolerances for some of the plant hormone type of materials which are used as growth regulators which do not come under the pesticide amendment?

The term "pesticide chemical" includes only substances which are classed as "economic poisons" under the Federal Insecticide, Fungicide, and Rodenticide Act. Plant hormone materials, defoliants, and nematocides are not economic poisons within the meaning of that Act; thus tolerances cannot be set for them under the Miller Bill procedures.

Tolerances may be established for such materials under Section 406 of the Federal Food, Drug, and Cosmetic Act. This is the public hearing procedure which was used in the 1950 residue hearings in Washington.

Some labels bear directions for the use of pesticides on growing crops within 10 days of harvest. If a grower determines by trial and commercial analyses of samples that he can use this pesticide on certain crops within 3 days of harvest, even though its use is contrary to label directions, he may adopt such a schedule. Conceivably, he may get by for a season or two and then, due to weather conditions or other factors, be confronted with a seizure of his vegetables. Would Mr. Rankin care to indicate the basis and reasoning used by FDA when it establishes pesticide tolerances for fresh vegetables?

If a grower deviates from label directions for use of a pesticide, he takes a calculated risk, and should assure himself, before marketing the crop, that pesticide residues are within tolerance limits. When FDA establishes a tolerance for residue on a fresh vegetable, it is satisfied that the tolerance can be met if proposed directions for the pesticide label are followed.

It is believed that we are in, and will be in a transition period for the next few years with respect to the operation of the Miller Amendment. What position will FDA take with respect to the continued usage of older materials already cleared under earlier informal procedures, but for which detailed fomal data are not yet available?

We do not know what products the questioner refers to.

We hope to establish tolerances or exemptions for all of the older pesticides that need them by July 22, 1956. On July 22, 1956, the new law will be fully effective for all pesticide chemicals; FDA has no authority to grant extensions beyond that date.

A pesticide chemical that does not have definite status under the Miller Bill will have the equivalent of a zero tolerance; if employed on crops, it should be used so that it leaves no residues when the crop is shipped.

Table IV. Pesticide Chemicals with Tolerances Higher than Zero[a,b]

Aldrin	Heptachlor
Aramite	Lead arsenate
Benzene hexachloride	Lindane
Calcium arsenate	Magnesium arsenate
Calcium cyanide	Malathion
Captan	Maneb
Chlordan	Metacide
Chlorobenzilate	Methoxychlor
3-(*p*-chlorophenyl)-1,1-dimethylurea	Methyl bromide
Chlortetracycline	Naphthalene acetic acid
Copper arsenate	Nicotine-containing compounds
DDT	Parathion
2,4-D	Phenothiazine
3-(3,4-Dichlorophenyl) 1,1-Dimethylurea	Phygon
Dicyclohexylamine salt of dinitro-*o*-cyclohexylphenol	SES
	Sodium arsenate
Dieldrin	Sulphenone
Dinitro-*o*-cyclohexylphenol	Systox
EPN	Tarter emetic
Ethylene dibromide	TDE
Ferbam	Toxaphene
Fluorine compounds	Zineb
Glyodin	Ziram

[a] As of Feb. 10, 1956.
[b] The tolerances apply only to crops specified in the Federal Regulations.