

Measurement of Residual Arochlors and other Pesticides in Meat Products by GC / ECD-NPD

The use of pesticides and insecticides in the Agricultural Industry has always been widespread in the past. However, their use is now under close scrutiny by many consumer and government agencies since the short-term and cumulative effects of these materials has been shown to be potentially hazardous to humans and animals.

Since almost all domesticated livestock feed is of fresh or harvested plant material, it's common to find pesticide residues collecting in the flesh of these animals. The pesticides are then passed on to the people that consume the meat processed from these animals. Many government regulations have specific tolerances for such contamination in food products. Standard methods from AOAC, U.S. FDA, and USDA are available to illustrate the complexity and diversity of these regulations.

A gas chromatograph with a packed or macro-bore capillary column can be used with an Electron Capture Detector (ECD) to determine the total Halogenated (Chlorinated) material and a sensitive Flame Photometric Detector (FPD) to determine organo-phosphorus containing materials. Some representative quantitative data is shown below.

These analyses were researched and developed on a Buck 910 GC / ECD-FPD system using a DB-5 and DB-624 column for all materials, and

a DB-1701 specifically for the organo-phosphorus materials. Meat and plant samples were extracted with Ether : Hexane : Alcohol and run against calibrated reference materials for precise and accurate quantitation.

Results are Total Pesticides in $\mu\text{g}/\text{kg}$ on GC system by manual injection.

Samples: Texas Beef, Argentinian Beef, Jersey Pigs, Maryland Chickens.

Sample ID	Assay by E.C.D.	Assay by F.P.D.
Texas Beef	655	74
Argentinian Beef	1250	263
Jersey Pigs	210	12
Maryland Chickens	536	105

Complex mixtures, which beef, pork, and chicken products certainly are, can be easily resolved into their individual components to allow precise and accurate analysis of toxic or undesirable materials. The ultimate flexibility of the Buck 910 GC design permits a wide range of testing capabilities.

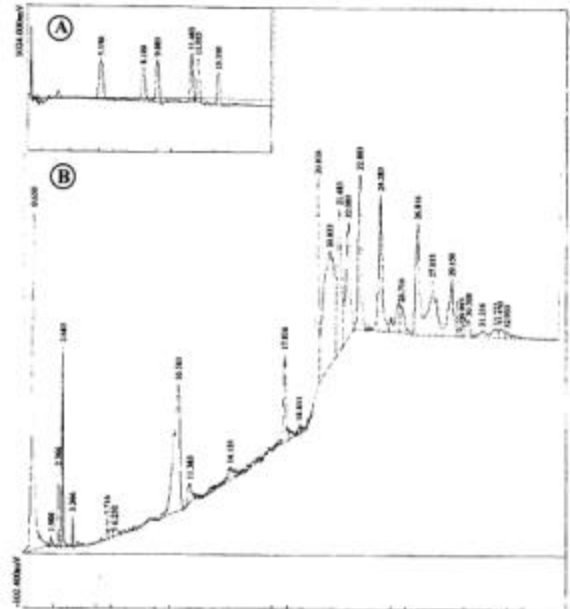
SIC: 021, 024, 025, 201

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A.

Description: FPD
Column: 30 meter DB-1701
Carrier: Nitrogen @ 3.0mL/min
Sample: Texas Beef Extract

Component	Retention
porate	5.150
Diazinon	.100
dsulfoton	.083
prathion	.483
unknown metabolite	11.933
Devrinol	13.350



B.

Description: ECD
Column: 30 meter DB-5
Carrier: Nitrogen @ 3.0mL/min
Sample: Texas Beef Extract

Component	Retention
Dalapon	2.366
2-4 D	2.683
pentachlorophen	10.583
silvex (2_4_5-T)	20.016
lindane	21.483
simazine	22.083
atrazine	22.883
heptachlor	24.283
alachlor	25.716
hept. Epoxide	26.816
endrin	27.833
picloram	29.150
methoxychlor	30.300



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