PROJECT NO. _____
REPORT FILE

Industrial **BIO-TEST** *Laboratories, Inc.*
1810 FRONTAGE ROAD
NORTHBROOK, ILLINOIS 60062
AREA CODE 312
TELEPHONE 272-3030

REPORT TO

MONSANTO COMPANY
ORGANIC CHEMICALS DIVISION

30-DAY TISSUE COLLECTION STUDY IN ALBINO RATS WITH AROCLORS

BTL - AROCLOR II

IBT NO. B7009

DSW 380693

STLCOPCB4100711

Industrial **BIO-TEST** *Laboratories, Inc.*
1810 FRONTAGE ROAD
NORTHBROOK, ILLINOIS 60062
AREA CODE 312
TELEPHONE 272-3030

April 15, 1969

Dr. William H. Hunt, Toxicologist
Medical Department
Monsanto Company
800 North Lindbergh Boulevard
St. Louis, Missouri 63166

Dear Dr. Hunt:

Re: IBT No. B7009 - 30-Day Tissue Collection Study
In Albino Rats with Aroclors - BTL - Aroclor II

We are submitting herewith our laboratory report dated April 15, 1969 prepared in connection with the above study.

Very truly yours,

J. C. Calandra
President

JCC/kjl

DSW 380694

REPORT TO

MONSANTO COMPANY
ORGANIC CHEMICALS DIVISION

30-DAY TISSUE COLLECTION STUDY IN ALBINO RATS WITH AROCLORS

BTL - AROCLOR II

IBT NO. B7009

I. Introduction

Samples identified as (1) Aroclor 1242, Lot No. AK-255, (2) Aroclor 1254, Lot No. AK-38, (3) Aroclor 1260, Lot No. AK-3, (4) Aroclor 5460, Lot No. AK-390, (5) Halowax 1014, 62% Cl, (6) Halowas 1099, 52% Cl, (7) Toxaphene and (8) Technical DDT were received for the purpose of conducting a 30-day feeding study employing albino rats as test animals.

DSW 380695

II. Summary

Sixteen groups of albino rats were fed diets containing either Aroclor 1242, Aroclor 1254, Aroclor 1260, Aroclor 5460, Halowax 1014, Halowax 1099, Toxaphene or DDT for a period of 30 days.

During the feeding period representative samples of urine, feces and test diets were collected from rats of each group and sent to Monsanto Chemical Company. At the completion of the study the rats were sacrificed and samples of liver, kidneys, muscle and fat were removed, frozen and shipped to Monsanto for analyses.

Respectfully submitted,

INDUSTRIAL BIO-TEST LABORATORIES, INC.

James Plank

Report prepared by: James Plank
Group Leader
Rat Toxicity Department

M. L. Keplinger

Report approved by: M. L. Keplinger, Ph.D.
Assistant Laboratory Director

Otis E. Fancher

Otis E. Fancher, Ph.D.
Director

April 15, 1969

nk

DSW 380696

III. Procedure

A. Experimental Animals

The animals employed in the study were Charles River strain* albino rats. Five hundred and thirty rats (265 males and 265 females) were selected for the experiment and housed five per cage. Each cage bore a color-coded card identifying the rat with respect to project number, test material assignment, dietary level and sex.

B. Organization of Groups

A structural outline of the experiment is shown in Table I.

* Charles River Breeding Laboratories, North Wilmington, Mass.

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TABLE I

Outline of Experiment

Test Material Assignment	Number of Animals Male	Female	Dietary Level (ppm)
Control	25	25	No Material Administered
Aroclor 1242	15	15	300
	15	15	1000
Aroclor 1254	15	15	300
	15	15	1000
Aroclor 1260	15	15	300
	15	15	1000
Aroclor 5460	15	15	300
	15	15	1000
Halowax 1014	15	15	100
	15	15	300
Halowax 1099	15	15	300
	15	15	1000
Toxaphene	15	15	50
	15	15	300
DDT	15	15	50
	15	15	300

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DSW 380698

C. Diet Preparation

The diets were prepared by blending the appropriate amount of each respective test material with standard rat ration.

Fresh diets were prepared weekly and sufficient food was placed in each cage to allow for ad libitum feeding.

Samples of each diet were collected and shipped to Monsanto for analyses.

D. Urine and Feces Collection

Urine and fecal samples were collected from four males and four females from each group after 28 days of feeding. These samples were then frozen and shipped to Monsanto.

No samples were obtained from rats fed Aroclor 1242, Aroclor1254, Aroclor 1260 or 300 ppm Halowax. These animals were sacrificed prior to the notification to collect the urine and feces.

E. Pathology

Following 30 days of feeding, all rats were sacrificed by carbon dioxide asphyxiation. These rats had access to their respective diets until 30 minutes prior to sacrifice.

The liver, both kidneys and samples of muscle and fat were taken from each animal at the time of autopsy. These tissues were then pooled according to sex and group, packaged and frozen. The frozen samples were then packed with dry ice in styrofoam containers and shipped to Monsanto Chemical Company for analyses.

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Industrial **BIO-TEST** *Laboratories, Inc.*
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TELEPHONE 272-3030

REPORT TO

MONSANTO COMPANY

CHICKEN RESIDUE STUDIES ON AROCLORS AND VARIOUS OTHER MATERIALS

BTL - AROCLOR

IBT NO. J7010

DSW 380700

STLCOPCB4100718

Industrial **BIO-TEST** *Laboratories, Inc.*
1810 FRONTAGE ROAD
NORTHBROOK, ILLINOIS 60062
AREA CODE 312
TELEPHONE 272-3030

April 23, 1969

Dr. William H. Hunt, Toxicologist
Medical Department
Monsanto Company
800 N. Lindbergh Boulevard
St. Louis, Missouri 63166

Dear Dr. Hunt:

Re: IBT No. J7010 - Chicken Residue Studies on
Aroclors & Various Other Materials - BTL-Aroclor

We are submitting herewith our laboratory report dated April 23, 1969 prepared in connection with the above study.

Very truly yours,

J. C. Calandra
President

JCC/kjl

DSW 380701

REPORT TO

MONSANTO COMPANY

CHICKEN RESIDUE STUDIES ON
AROCLORS AND VARIOUS OTHER MATERIALS

BTL - AROCLOR

IBT NO. J7010

I. Introduction

The following materials were received from Monsanto Company for the purpose of conducting residue studies in white Leghorn hens:

1. Aroclor 1242, Lot No. AK-255
2. Aroclor 1254, Lot No. AK-38
3. Aroclor 1260, Lot No. AK-3
4. Aroclor 5460, Lot No. AK-390
5. Halowax 1014, 62% Cl
6. Halowax 1099, 52% Cl
7. Toxaphene
8. Technical DDT

This investigation was conducted at Wedge's Creek Research Farm Division, Industrial Bio-Test Laboratories, Inc.

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II. Summary

A two-phase residue study in mature white Leghorn hens was conducted on the following test materials:

1. Aroclor 1242, Lot No. AK-255
2. Aroclor 1254, Lot No. AK-38
3. Aroclor 1260, Lot No. AK-3
4. Aroclor 5460, Lot No. AK-390
5. Halowax 1014, 62% Cl
6. Halowax 1099, 52% Cl
7. Toxaphene
8. Technical DDT

The results of the first phase revealed the approximate oral median lethal dose (LD_{50}) values to be in excess of 10 g/kg for the four Aroclor materials, the two Halowax materials and DDT. The LD_{50} value for Toxaphene was found to be 316 mg/kg (95% C. L. 215-464 mg/kg).

During the second phase, groups of four birds received daily doses of one-fifth of the respective LD_{50} for seven days. Tissue, feather and fecal samples were obtained from these birds at the terminal

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sacrifice. These samples were frozen and shipped to Monsanto Company for analyses.

Respectfully submitted,

INDUSTRIAL BIO-TEST LABORATORIES, INC.

Allen A. Wolvin

Report prepared by: Allen A. Wolvin
Supervisor - WCRF

Donald H. Jenkins, D.V.M.

Report approved by: Donald H. Jenkins, D. V. M.
Manager and Technical Director
Wedge's Creek Research Farm

Otis E. Fancher

Otis E. Fancher, Ph. D.
Director

April 23, 1969

eje

DSW 380704

III. Procedure

Mature white Leghorn hens were utilized in this investigation. All birds were observed for 14 days prior to experimental use to assure their suitability as test animals. The birds were housed in groups in separate colony pens and allowed feed* and water ad libitum. The study was conducted in two phases. In the first phase, the approximate oral median lethal dose (LD_{50}) of each material was determined. Repeated sublethal doses of the respective test materials were administered to selected groups for residue analyses in the second phase.

A. Phase I, Acute Oral Median Lethal Dose (LD_{50})

The procedure followed in the determination of the LD_{50} of each material was identical. Graded doses of the appropriate test material, in the form of a solution or suspension in corn oil, were administered to groups of two hens each via gavage. The birds were not fasted prior to dosage. Following dosage, the birds were observed for a 14-day period, after which time the oral median lethal dose (LD_{50}) was calculated using the method of Thompson and Weil**.

B. Phase II, Residue Study

Upon completion of Phase I, groups of four hens each received one-fifth of the LD_{50} of the respective test material for seven consecutive

* Purina Flock Chow, Ralston Purina Company, St. Louis, Missouri.
** Thompson, W. R. and Weil, C. S.: On the Construction of Tables for Moving Average Interpolation, Biometrics, March 1952.

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days via gavage. The test materials were placed in solution or suspension in corn oil in the same manner as in Phase I. One group of four hens was selected for use as a Control and received no test material.

The body weight of each bird was recorded initially and on Day 8 (prior to sacrifice). Observations for untoward behavioral reactions were made daily. On dosage Days 5 through 7, fecal samples were collected from each test material group, packaged and frozen for shipment to Monsanto Company for residue analysis.

Eight days after the initial dosage, the birds were sacrificed, defeathered and eviscerated. The feathers, intestinal tract, liver, lungs, heart, and spleen from each bird were packaged separately, identified and frozen with the carcass. Samples of fat from the birds in each test material group were pooled, packaged and frozen.

The carcass, feathers, organs and fecal material from each group were shipped to Monsanto Company for analysis.

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IV. Results

A. Phase I, Acute Oral Median Lethal Dose (LD_{50})

1. Mortality Data

Mortality data obtained during this phase are presented in Tables I and II.

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TABLE I

TEST MATERIALS: Aroclors, Halowaxes and DDT

Acute Oral Toxicity - White Leghorn Chickens

Mortality Data

Test Material	Dose Levels Tested (g/kg)	Mortality and Reactions	Concentration Tested (%w/v)
Aroclor 1242	1, 1.8, 4.6, 8.3, 10	None	50
Aroclor 1254	1, 1.8, 4.6, 8.3, 10	None	50
Aroclor 1260	5.6 & 10	None	50
Aroclor 5460	5.6 & 10	None	50
Halowax 1014	1, 5.6 & 10	None	25
Halowax 1099	1, 5.6 & 10	None	25
Technical DDT	0.3, 0.46, 0.68, 2.2, 3.2, 6.8, 10	None	50

Note: Due to the lack of mortality up to the 10 g/kg dose level, the approximate LD_{50} value used in the calculation of Phase II residue levels was considered to be 10 g/kg.

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TABLE II

TEST MATERIAL: Toxaphene

Acute Oral Toxicity - White Leghorn Chickens

Mortality Data

Dose Level (mg/kg)	Concentration Tested (% w/v)	Number of Birds Tested	Reactions	Percent Dead
215	3	2	None	0
316	3	2	1 dead in 18 hrs.	50
464	3	2	2 dead in 18 hrs.	100
681	3	2	2 dead in 2 hrs.	100

Acute Oral Median Lethal Dose (LD_{50}) = 316 mg/kg

95% Confidence Limits of LD_{50} = 215 - 464 mg/kg

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B. Phase II, Residue Study

1. The initial and terminal body weight data for the birds receiving the various test materials and the control birds are presented in Tables III, IV and V. All birds in all test groups lost weight during the dosing period.

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TABLE III

TEST MATERIALS: Aroclors

Residue Study - White Leghorn Chickens

Body Weight Data

Test Material	Bird Number	Dose Level* (g/kg)	Body Weights - kilograms Day: 0	8
Aroclor 1242	301	2	1.95	1.27
	303		2.38	1.84
	307		1.97	1.53
	309		2.29	1.48
Aroclor 1254	304	2	2.24	1.77
	305		1.86	1.39
	351		2.01	1.48
	353		2.14	1.67
Aroclor 1260	159	2	2.46	1.94
	361		1.97	1.70
	438		2.00	1.57
	440		2.04	1.59
Aroclor 5460	431	2	1.83	1.50
	433		1.90	1.38
	448		1.97	1.47
	449		2.26	1.78

* One-fifth of the previously determined LD_{50}.

DSW 380711

TABLE IV

TEST MATERIALS: Halowaxes

Residue Study - White Leghorn Chickens

Body Weight Data

Test Material	Bird Number	Dose Level* (g/kg)	Body Weights - kilograms Day: 0	8
Halowax 1014	357	2	1.82	1.21
	493		2.10	1.55
	494		2.07	1.61
	495		2.09	1.51
Halowax 1099	355	2	2.02	1.54
	359		1.80	1.29
	368		2.06	1.55
	492		2.06	1.48

* One-fifth of the previously determined LD_{50}.

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TABLE V

TEST MATERIALS: Technical DDT and Toxaphene

Residue Study - White Leghorn Chickens

Body Weight Data

Test Material	Bird Number	Dose Level* (g/kg)	Body Weights - kilograms Day: 0	Day: 8
Technical DDT	310	2	1.82	1.29
	354		1.59	1.17
	365		2.37	1.70
	372		2.38	1.87
Toxaphene	154	63.5 mg/kg	2.00	**
	155		2.25	**
	174		2.29	1.71
	175		2.20	1.62
Control (no test material)	150	None	2.12	2.17
	160		1.97	1.92
	370		2.09	2.14
	497		2.43	2.47

* One-fifth of the previously determined LD_{50}.

** Found dead on the fifth day of dosing.

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2. Reactions

a. Aroclors

Birds in each Aroclor group appeared weak on Day 3. Anorexia was observed on Day 5. These reactions persisted through Day 7.

b. Halowaxes

Birds receiving Halowax 1014 appeared weak on Day 4. Those receiving Halowax 1099 appeared weak on Day 2. Birds in both groups exhibited anorexia on Day 5. These reactions persisted through Day 7.

c. Technical DDT

On Day 4, all birds appeared weak and exhibited slight tremors. These reactions persisted through Day 7.

d. Toxaphene

All birds appeared weak on Day 3. One bird exhibited severe clonic convulsions on Day 4; the others exhibited slight occasional tremors. Two birds were found dead on Day 5. Tremors and weakness persisted in the survivors through Day 7.

e. Control

No abnormal behavioral reactions were observed among the Control birds during the investigation.

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3. Mortality

Two birds receiving Toxaphene were found dead on Day 5.

No other mortalities were observed among any of the other test material groups.

4. Tissue Samples

Individual livers, hearts, spleens, lungs, intestinal tracts, carcasses and feathers were packaged and frozen at time of sacrifice. Pooled fat samples from the birds in each test material group were packaged and frozen. These frozen tissues, along with the fecal samples from each group were shipped to Monsanto Company for residue analysis.

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