1-9-91 cont

DATA EVALUATION

1. CHEMICAL: Cypermethrin

2. FORMULATION: 87.8 % active ingredient (Technical grade) cis: trans 53:47

3. CITATION: Roberts, N.L., C. Fairley, D. Chanter, A. McAllister, and R. Almond (1981) The effect of dietary inclusion of cypermethrin on reproduction in the bobwhite quail. Unpublished study submitted 12/28/81 by ICI Americas Inc., Wilmington, Delaware.

EPA Accession No. 070561 MRID 00090034

4. REVIEWED BY: Thomas B. Johnston
Biologist, EEB/HED

5. REVIEW DATE: 3/25/82

6. TEST TYPE: Avian Reproduction

7. REPORTED RESULTS: Cypermethrin levels of up to 50 ppm in the diet have no apparent effects on reproduction in bobwhite quail.

8. REVIEWER'S CONCLUSION: This study is scientifically sound, and fulfills USEPA guideline requirements for an avian reproduction test using an upland gamebird. Cypermethrin dietary levels of up to 50 ppm have no apparent effects on reproduction in bobwhite quail.

Statistics attached to verify results + conclusion.
Anne Stavola 1/9/91

Materials/Methods

Protocol generally followed the requirements of USEPA proposed guidelines of 3/7/80. The adults used were young quail approaching their first breeding season. They were obtained from Lincolnshire Pheasantries, Boston, Lincolnshire, and were fed test or control diets for 19 weeks prior to commencement of the egg-laying period, which lasted 12 weeks.

Statistical Analysis

The following parameters were analyzed: adult food consumption and body-weight, number of eggs laid and proportion damaged egg weight and shell thickness, number of infertiles, embryonic deaths, hatchings, 14-day-old survivors, and chick bodyweights at hatching and 14 days later. Analysis methods included standard two-way analysis of variance, variance ratios, and where appropriate, Student's t-tests and Williams' tests.

Discussion/Results

The final report by Huntingdon Research Center contained information that was used to construct the following table:

		Technical Cypermethrin (ppm)	
	Controls	5	50
Eggs Laid[a]	563/841	486/830	436/910
Eggs Cracked or Broken[a]	118/151	51/92	76/161
Eggs Set	1014	1058	984
Viable Embryos	880	898	860
Live Three-Week Embryos	871	889	848
Normal Hatchlings	828	829	763
14-Day Old Survivors	573	565	568
Eggs Laid/Hen in 12 Weeks[b]	50	47	48
14-Day Old Survivors/Hen[b]	20	20	20
Eggs Cracked of Eggs Laid (%)	19.2	10.9	17.6
Viable Embryos of Eggs Set (%)	86.8	84.9	87.4
Live Three-Week Embryos of Viable Embryos (%)	99.0	99.0	98.6
Normal Hatchlings of Live Three-Week Embryos (%)	95.0	93.3	90.0
14-Day Old Survivors of Normal Hatchlings (%)	69.2	68.2	74.4

[a]Weeks 1-6/Weeks 7-12

[a]Based on 28 hens

Hatchlings - Bobwhite Quail

	Cypermethrin Technical (ppm)		
	Controls	5	50
Number of Weighed	813	818	759
Mean Body Weight (g)	6.4	6.6	6.4

14-Day Old Survivors - Bobwhite Quail

	Cypermethrin Technical (ppm)		
	Controls	5	50
Number of Weighed	573	565	568
Mean Body Weight (g)	21.1	20.5	20.7

Egg Weight and Eggshell Thickness - Bobwhite Quail

	Cypermethrin Technical (ppm)		
	Controls	5	50
Number of Eggs Weighed/ and Measured	1395/120	1308/132	1328/125
Mean Egg Weight (g)	10.1	10.0	9.9
Mean Shell Thickness (mm)	.19	.18	.19

Reviewer's Conclusions

Validation Category: Core

Category Rationale: N/A

Category Repairability: N/A

Cypermethrin Bobwhite

10:15 Wednesday, December 12, 1990

OBS	TRT	EL	EC	ES	VE	LE	NH	FH
1	a	116	12	96	87	86	85	52
2	a	118	25	80	77	76	68	34
3	a	81	2	70	67	65	62	42
4	a	99	21	68	42	42	37	23
5	a	121	25	85	82	81	78	57
6	a	67	11	50	49	49	46	39
7	a	138	39	86	85	85	82	54
8	a	109	26	71	38	38	39	31
9	a	120	13	93	71	69	62	50
10	a	137	26	97	94	94	87	67
11	a	91	18	65	58	57	50	43
12	a	73	5	63	48	48	45	30
13	a	70	17	48	41	41	35	21
14	a	64	16	42	42	42	38	30
15	b	96	7	79	46	46	40	33
16	b	74	12	57	27	26	18	9
17	b	111	9	90	76	72	64	32
18	b	91	16	66	66	66	60	44
19	b	120	10	99	95	94	90	73
20	b	90	2	81	69	69	64	40
21	b	110	8	92	86	86	78	42
22	b	136	13	111	87	86	81	50
23	b	117	11	94	89	87	82	65
24	b	86	9	69	58	58	56	40
25	b	47	7	34	34	34	34	29
26	b	48	9	30	25	25	23	22
27	b	111	8	94	88	88	77	47
28	b	79	7	62	52	52	48	39
29	c	74	11	56	42	42	41	31
30	c	100	10	81	78	78	74	47
31	c	85	9	69	66	66	48	41
32	c	105	14	78	75	69	64	47
33	c	83	16	60	47	47	41	32
34	c	112	24	79	62	61	53	41
35	c	102	10	80	70	70	66	51
36	c	76	28	40	38	37	28	20
37	c	113	24	75	72	72	69	47
38	c	120	18	91	75	73	65	52
39	c	68	6	55	49	49	45	33
40	c	114	10	93	82	82	79	65
41	c	111	16	83	73	72	57	40
42	c	83	19	44	31	29	28	21

1. ANALYSIS OF EL DATA 2
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General Linear Models Procedure
Class Level Information

a= Control
b= 5 ppm
c= 50 ppm

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General Linear Models Procedure

Duncan's Multiple Range Test for variable: RESP

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 39 MSE= 552.4762

Number of Means 2 3
Critical Range 17.97 18.89

Means with the same letter are not significantly different.

(1) Eggs Laid

Duncan Grouping	Mean	N	TRT
A	100.286	14	a
A			
A	96.143	14	c
A			
A	94.000	14	b

Alpha= 0.05 df= 39 MSE= 49.27656

Number of Means 2 3
Critical Range 5.366 5.642

Means with the same letter are not significantly different.

(2) Eggs Cracked

Duncan Grouping	Mean	N	TRT
A	18.286	14	a
A			
A	15.357	14	c
B	9.143	14	b

Alpha= 0.05 df= 39 MSE= 391.7363

Number of Means 2 3
Critical Range 15.13 15.91

Means with the same letter are not significantly different.

(3) Eggs Set

Duncan Grouping	Mean	N	TRT
A	75.571	14	b
A			
A	72.429	14	a
A			
A	70.286	14	c

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Alpha= 0.05 df= 39 MSE= 419.4377

Number of Means 2 3
Critical Range 15.66 16.46

Means with the same letter are not significantly different.

(4) Viable Embryos

Duncan Grouping	Mean	N	TRT
A	64.143	14	b
A			
A	62.929	14	a
A			
A	61.429	14	c

Alpha= 0.05 df= 39 MSE= 409.3388

Number of Means 2 3
Critical Range 15.47 16.26

Means with the same letter are not significantly different.

(5) Live embryos

Duncan Grouping	Mean	N	TRT
A	63.500	14	b
A			
A	62.357	14	a
A			
A	60.500	14	c

Alpha= 0.05 df= 39 MSE= 384.9176

Number of Means 2 3
Critical Range 15.00 15.77

Means with the same letter are not significantly different.

(6) Recovered Hatched

Duncan Grouping	Mean	N	TRT
A	58.214	14	b
A			
A	58.143	14	a
A			
A	54.143	14	c

General Linear Models Procedure

Duncan's Multiple Range Test for variable: RESP

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 39 MSE= 384.9176

Number of Means	2	3
Critical Range	15.00	15.77

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	TRT
A	58.214	14	b
A			
A	58.143	14	a
A			
A	54.143	14	c

7) # 14-day old hatchings