NATIONAL TOXICOLOGY PROGRAM
BOARD OF SCIENTIFIC COUNSELORS MEETING
MARCH 28, 1985

Peer Review of the Data from the Raltech Lifetime Feeding Study With Irradiated Chicken Meat In CD-1 Mice By the Technical Reports Review Subcommittee and Panel of Experts

Summary Minutes

The National Toxicology Program (NTP) Board of Scientific Counselors Technical Reports Review Subcommittee and Ad Hoc Panel of Experts (the Panel) met at 1:30 p.m. on March 28, 1985, in the Conference Center, Building 101, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina. This open meeting was held at the request of the Center for Food Safety and Applied Nutrition (CFSAN), Food and Drug Administration (FDA), for the purpose of providing independent peer review of the data regarding carcinogenicity from lifetime studies in which irradiated chicken meat was fed to CD-1 mice. The studies were sponsored initially by the U. S. Army and subsequently by the U. S. Department of Agriculture, conducted by Raltech Scientific, Inc., and submitted to the FDA for their review (Attachment 1: Federal Register Meeting Announcement; Attachment 2: Agenda). In advance of the meeting, the peer reviewers were provided with a data package consisting of: the charge from the Director, CFSAN; an executive summary; reviews by the Divisions of Toxicology and Pathology and the Center's Cancer Assessment Committee; and supporting statistical and pathology tables. Also prior to the meeting, the four pathologists associated with the Panel examined slides of testes from male mice on the study. Dr. Jerry Hook chaired the meeting. The complete listing of peer reviewers is given in Attachment 2.

Dr. Hook read the rationale for requesting review by the Panel and the charge to the Panel as stated in a letter from Dr. Sanford Miller, Director, CFSAN, to Dr. David P. Rall, Director, NTP. "The report prepared by Raltech scientists indicated the strong possibility that chicken irradiated at approximately six megarads produced testicular tumors in CD-1 mice in lifetime feeding studies. Our Division of Pathology has re-examined the histopathology on which the above claim was based for both the control, as well as the treated animals. In brief, their findings differed sufficiently from the original Raltech report that our Cancer Assessment Committee has concluded, based on these new diagnoses that there is no evidence to support the induction of testicular tumors. We would, therefore, like the peer review to focus on two primary questions. First, does the peer review committee agree or disagree with the diagnoses of our Division of Pathology? And, secondly, based on whatever diagnoses the peer review pathologists make, does the peer review committee believe there is a treatment related effect?"

As background, Dr. W. G. Flamm, FDA, said that the Agency had sometime ago made the proposal that fresh vegetables and meat could be irradiated at 100 kilorads or less without the necessity for additional toxicological data. They believed

that based on the totality of the information obtained from previous studies irradiating food at proposed levels would not produce radiolytic products that would be toxicologically demonstrable by traditional, classical toxicological techniques. The conclusions in the Raltech study seemed to suggest there may be adverse effects. Thus, he said the major focus of this meeting would be on the pathology and what the diagnoses say about possible effects of treatment.

Toxicology Review: Dr. Hiltje Irausquin, CFSAN, described the experimental design of the study. She said there were five experimental groups: three "control" groups where mice were fed a chow diet (group N), chicken processed by freezing (group F) or by thermal sterilization (group T), and two treatment groups where mice were fed chicken meat irradiated with either gamma rays (group G) or beta rays (group E) at a dose of 5.9 megarads. Interim sacrifices were performed at 3, 6, 12, 15 and 18 months for gross pathology and histopathology of all major organs, clinical chemistry and other effects. The major health problem reported in all chicken-fed groups was chronic urinary system disease, especially higher incidences of nephropathology and mineralization of the kidneys. A reported increased incidence of alveolar/bronchiolar neoplasms in the original report was not considered by the FDA as being an effect of feeding irradiated chicken. Dr. Irausquin then discussed the reported increased incidence of interstitial cell tumors of the testes in the two groups administered irradiated chicken meat compared to control groups. Due to the apparent small increase and some minor discrepancies in reported incidences of the testicular tumors, the Cancer Assessment Committee concluded that the testicular findings needed to be verified. Therefore, the Committee requested that the histopathological slides of tissue sections of the testes be obtained and reviewed by the Division of Pathology.

Pathology Review: (Attachment 3) Dr. Ronald Moch, CFSAN, stated that all the microslides containing testicular tissue were examined by one or more of the Division pathologists and testicular proliferative lesions were classified as: (1) interstitial cell hyperplasia; (2) interstitial cell tumor, benign or malignant; (3) Sertoli cell tumor, benign; or (4) tumor not otherwise specified (NOS). Of the 12 microslides containing proliferative testicular lesions, there were major discrepancies in interpretation between the Division and Raltech's pathologists in four cases (Animal No's N1185, T3072, G4148, and E5035), and minor discrepancies in two cases (F2298 and G4163) (Attachment 3 - Amended Table 1). Dr. Moch discussed in detail the particulars for these six cases.

He noted that there appeared to be no increase in interstitial cell hyperplasia of the testes among the five groups. The Division of Pathology's assessments of proliferative testicular lesions are summarized in Attachment 3 - Amended Table 2. Dr. Moch said that Dr. Mostofi, Chief of Genitourinary Pathology, Armed Forces Institute of Pathology, had examined the slides diagnosed as tumor, NOS, and Sertoli cell tumor, and suggested that it would be appropriate to combine these tumors with the interstitial cell tumors under a classification of gonadal stromal tumors (Attachment 3 - Amended Table 3). Although the historical incidence of interstitial cell tumors in male CD-1 mice is less than one percent, the Division's pathologists concluded that the increased findings of testicular lesions in the groups fed irradiated chicken meat, evaluated either as interstitial cell tumors per se or gonadal stromal tumors, were considered of spontaneous occurrence and not related to the treatment.

Dr. Moch stated that these conclusions were based on the following points (Attachment 3 - page 4): (1) there was no increase in interstitial cell

hyperplasia in the testes; (2) there was no evidence of progression of testicular lesions from hyperplasia to neoplasia; (3) there were no demonstrable toxic lesions in the testes which could have contributed to pathogenesis of neoplasia; (4) all of the testicular tumors were unilateral ; (5) only one testicular tumor was interpreted as malignant; (6) a majority of the tumors were reported in animals at terminal sacrifice; and (7) cystic vascular interstitial cell tumors mimic other tumors and the reported incidence of interstitial cell tumors was probably not represented fully in the historical control data.

Statistical Review: Dr. Irausquin said the analysis was performed on the incidences of gonadal stromal tumors as diagnosed by the Division of Pathology. Time adjusted analyses were performed. Given the non-lethal nature of these tumors, an incidental (prevalence) analysis was considered most appropriate. However, non-incidental analyses were also performed for comparison because Raltech's analyses were non-incidental. Using the incidental test, the only P value of less than 0.05 was obtained when all control groups combined (N+F+T) were compared to the two treatment groups combined (G+E), P=0.035. Because of the large differences in dietary composition between the chow control group and the chicken-fed control groups, the validity of their being combined could be questioned she said. Thus, the results support a conclusion that the gonadal stromal tumors were not related to ingestion of either gamma-irradiated or electron-irradiated chicken.

Discussion by the Peer Review Panel: Dr. Kociba chaired the slide review and led the discussion of the histopathologic findings. He said the pathologists examined all the slides of testes with reported proliferative lesions of neoplastic or hyperplastic nature and then tried to reach a consensus. He presented a table representing this consensus (Attachment 4). Noting that it is often very difficult to draw a hard and fast line between interstitial cell hyperplasia and neoplasia, he pointed to a category titled "Interstitial Cell Hyperplasia/Interstitial Cell Tumor?" A category of "Combination Gonadal Stromal Tumors/Hyperplasia" also was included. Dr. Kociba concluded that overall their assessments did not differ much from the diagnoses of the FDA pathologists.

Dr. Hardisty emphasized that the category of "Combination Gonadal Stromal" included those which the reviewing pathologists felt were definitely neoplasms or very likely neoplasms, i.e., columns 1, 3 and 4 of Attachment 4. He commented that slides with the contralateral testes were not available making it difficult to say there was no evidence of progression from hyperplasia to neoplasia. Dr. Purchase observed that six of the tumors observed histologically were not detected in the gross examination (Attachment 3 - Amended Table 1).

Dr. Swenberg and Dr. Hardisty said this observation might reflect sampling error and suggested a less than thorough gross examination since some of these lesions were quite large.

On balance, Dr. Hardisty concluded that in some cases they agreed with the Raltech diagnoses and in others, the FDA diagnoses. The other pathologists concurred. Dr. Kociba stated there were no differences of any consequence among the Raltech, FDA and review pathologists in regard to the interpretation of the study. Dr. Hook reiterated that there seemed to be no marked disagreement but rather with those lesions where it was difficult to distinguish between hyperplasia and tumor the numbers came out sometimes in different columns. He concluded that the Panel had answered the first question of their charge.

In further discussion, Dr. Kotelchuck questioned the appropriateness of combining testicular tumors into a single classification of "gonadal stromal tumors" since the net result is to eliminate any statistical significance between treatment and control groups for interstitial cell tumors. Dr. Hardisty replied that the classification properly encompasses both interstitial cell and Sertoli cell tumors in that they arise from the same embryological structure. Dr. Purchase commented on the design whereby the treatment began in utero, and as such, he said that animals from the same mother cannot be considered independent at any later time from the point of statistical analysis.

Dr. Hook asked that the Panel now consider the second question as to whether or not they believed there was a treatment related effect.

To begin, Dr. Kociba read the following statement as representing his judgement:

> "The relatively low incidence rates for proliferative lesions of testicular interstitial cells and related gonadal stromal tissue in male CD-1 mice as well as other unidentified variables that may have entered into the generation of the presently available data do not allow the study to be categorized as demonstrating a carcinogenic response as a result of gamma or electron irradiation of the chicken products fed to the mice."

Dr. Hardisty commented that the variables might include treatment of the chickens used in the study with synthetic estrogens which are commonly used to feminize or stimulate growth. Information was not available on whether the chickens had received estrogen treatment or whether tissue estrogen levels were measured. Dr. Swenberg said it was inappropriate to use the chow-fed controls (N group) in the comparisons because of the considerable weight differences between these animals and the chicken-fed animals. Obesity affects tumors, particularly those under endocrine control, which the testicular tumors are.

Although agreeing that combining of the tumors into a "gonadal stromal" category was appropriate, Dr. Kotelchuck asked for the statistical comparisons of the interstitial cell tumors (ICTs) alone. Dr. Irausquin responded that comparisons of ICTs from either chicken-fed control group (F or T) with either irradiated chicken-fed group (G or E) alone or combined (G + E) gave P values ranging from 0.02 to 0.04. Dr. Kotelchuck did agree that the preponderance of evidence is that there is not a carcinogenic effect although such a possibiity cannot be excluded completely. Dr. Hook commented that the FDA concluded the findings were not related to treatment whether the lesions were evaluated as interstitial cell tumors per se or as gonadal stromal tumors. Dr. Swenberg concurred that there was no good biological basis for an effect. He found bothersome the lack of a good historical control data base for these tumors in CD-1 mice.

Dr. Hook said there seemed to be a consensus developing around Dr. Kociba's statement or at least its essence which is that the available evidence does not allow us to say there was a carcinogenic effect. He pointed out that there was not a clear definition of the distinction between interstitial cell tumors and the gonadal stromal lesions. Dr. Purchase said he would support the seven points given by the FDA as a basis for their conclusion that there was no effect of treatment on increased tumor incidences (See pages 2 to 3). Dr. Swenberg concurred while disagreeing with the fifth point, i.e., the reviewer pathologists did not find any tumors they considered to be malignant.

Consensus conclusion of the Peer Review Panel: The statement formulated by Dr. Kociba reflected the consensus of the Panel. Restated, it is that: "The relatively low incidence rates for proliferative lesions of testicular interstitial cells and related gonadal stromal tissue in male CD-1 mice as well as other unidentified variables that may have entered into the generation of the presently available data do not allow the study to be categorized as demonstrating a carcinogenic response as a result of gamma or electron irradiation of the chicken meat fed to the mice."

Dated: February 5, 1985.

James F. Dickerson III,

Acting Assistant Secretary for Health.

[FR Doc. 85-4499 Filed 2-22-85; 8:45 am]

BILLING CODE 4160-15-M

National Institutes of Health

National Organ Transplant Act; Delegation of Authority

Notice is hereby given that in furtherance of the January 22, 1985 delegation by the Secretary of Health and Human Services to the Assistant Secretary for Health of authority under the National Organ Transplant Act, Pub. L. 98-507 (50 FR 3840), the Acting Assistant Secretary for Health has delegated to the Director, National Institutes of Health, with authority to redelegate, all the authorities under Title IV of Pub. L. 98-507 (42 U.S.C. 273 note), Bone Marrow Registry Demonstration and Study, excluding the authority to submit the reports to the Congress and congressional committees.

The above delegation to the Director, National Institutes of Health, became effective on February 5, 1985.

Dated: February 5, 1985.

James F. Dickson III,

Acting Assistant Secretary for Health.

[FR Doc. 85-4498 Filed 2-22-85; 8:45 am]

BILLING CODE 4140-01-M

Public Health Service

National Toxicology Program; Board of Scientific Counselors Meeting

Pursuant to Pub. L. 92-463, notice is hereby given of the meeting of the National Toxicology Program Board of Scientific Counselors, U.S. Public Health Service, in the Conference Center, Building 101, South Campus, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina, on March 28, 1985.

The meeting will be open to the public from 1:30 p.m. until adjournment for the purpose of providing peer review of the data regarding carcinogenicity from lifetime studies in which irradiated chicken was fed to CD-1 mice. The studies were sponsored initially by the U.S. Army and subsequently by the U.S. Department of Agriculture, conducted by Raltech Scientific, Inc., and submitted to the Food and Drug Administration (FDA) for their review. The review was requested by the Center for Food Safety and Applied Nutrition, FDA, and will be conducted by the Technical Reports Review Subcommittee of the Board in conjunction with an *ad hoc* panel of experts.

The meeting will commence with a brief overview of the studies. This will be followed with presentations by scientific staff from the Center for Food Safety and Applied Nutrition concerning the pathology findings. Sufficient time will be allowed for public comment.

The Executive Secretary, Dr. Larry G. Hart, Office of the Director, National Toxicology Program, P.O. Box 12233, Research Triangle Park, North Carolina 27709, telephone (919) 541-3971, FTS 629-3971, will furnish program information prior to the meeting and summary minutes subsequent to the meeting.

Dated: February 15, 1985.

David P. Rall,

Director, National Toxicology Program.

[FR Doc. 85-4472 Filed 2-22-85; 8:45 am]

BILLING CODE 4140-01-M

National Toxicology Program; Board of Scientific Counselors Meeting

Pursuant to Pub. L. 92-463, notice is hereby given of a meeting of the National Toxicology Program (NTP) Board of Scientific Counselors, U.S. Public Health Service, in the Conference Center, Building 101, South Campus, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina, on March 29, 1985.

The meeting will be open to the public from 9:00 a.m. until adjournment. The primary agenda topic is the completion of peer review on draft technical reports of long-term toxicology and carcinogenesis studies from the National Toxicology Program. Reviews will be conducted by the Technical Reports Review Subcommittee of the Board in conjunction with an *ad hoc* panel of experts.

Draft technical reports on the following chemicals (listed alphabetically with Chemical Abstracts Service registry numbers, routes of administration, and NTP chemical managers for each study) are tentatively scheduled to be peer reviewed on March 29.

Chemical (CAS registry No.)	Route	Chemical manager (phone No.)
C.I. Basic Red 9 (569-61-9).	Feed	Dr. W.C. Eastin (919-541-7941).
C.I. Disperse Blue 1 (2475-45-8).	Feed	Dr. E. Rauckman (919-541-7981).
H C Red 3 (2871-01-4).	Gavage	Dr. J.H. Mennear (919-541-4178).
Methylene Chloride (Dichloromethane) (75-09-2).	Inhalation	Dr. J.H. Mennear (919-541-4178).
o-Phenylphenol (90-43-7).	Dermal	Dr. M.I. Luster (919-541-4188).
4-Vinylcyclohexene (100-40-3).	Gavage	Dr. J.J. Collins (919-541-2264).

The Executive Secretary, Dr. Larry G. Hart, Office of the Director, National Toxicology Program, P.O. Box 12233, Research Triangle Park, North Carolina 27709, telephone (919-541-3971), FTS (629-3971), will furnish final agenda, rosters of subcommittee and panel members, and other program information prior to the meeting, and summary minutes subsequent to the meeting.

Dated: February 15, 1985.

David P. Rall,

Director, National Toxicology Program.

[FR Doc. 85-4471 Filed 2-22-85; 8:45 am]

BILLING CODE 4140-01-M

DEPARTMENT OF THE INTERIOR

Office of the Secretary

Final Determination To Extend Certification of No Adverse Impact on Theodore Roosevelt National Park and Lostwood National Wildlife Refuge Under Section 165(d)(2)(C)(iii) of the Clean Air Act

AGENCY: Department of the Interior.

ACTION: This notice announces the Federal Land Manager's final determination to extend the September 1982 certification of no adverse impact under section 165(d)(2)(C)(iii) of the Clean Air Act with respect to two Prevention of Significant Deterioration permits under consideration for extension by the North Dakota State Department of Health.

SUMMARY: On September 20, 1982 (47 FR 41480), the Department of the Interior announced the final determination made by the Federal Land Manager of Theodore Roosevelt National Park and Lostwood National Wildlife Refuge that five proposed sources in North Dakota subject to Prevention of Significant Deterioration of air quality requirements (PSD) would not adversely affect the resources of the park and refuge (wilderness portion). The Federal Land Manager made the final determination after full consideration of the best available information and the public comments received on the issues involved. On January 12, 1983, the North Dakota State Department of Health (NDSDH) issued Air Pollution Control Permits to Construct to four of these sources. The Nokota Company (Nokota) and Basin Electric Power Cooperative

AGENDA

Board of Scientific Counselors
National Toxicology Program

March 28, 1985
1:30 p.m.

Conference Center, Building 101
National Institute of Environmental Health Sciences
Research Triangle Park, North Carolina

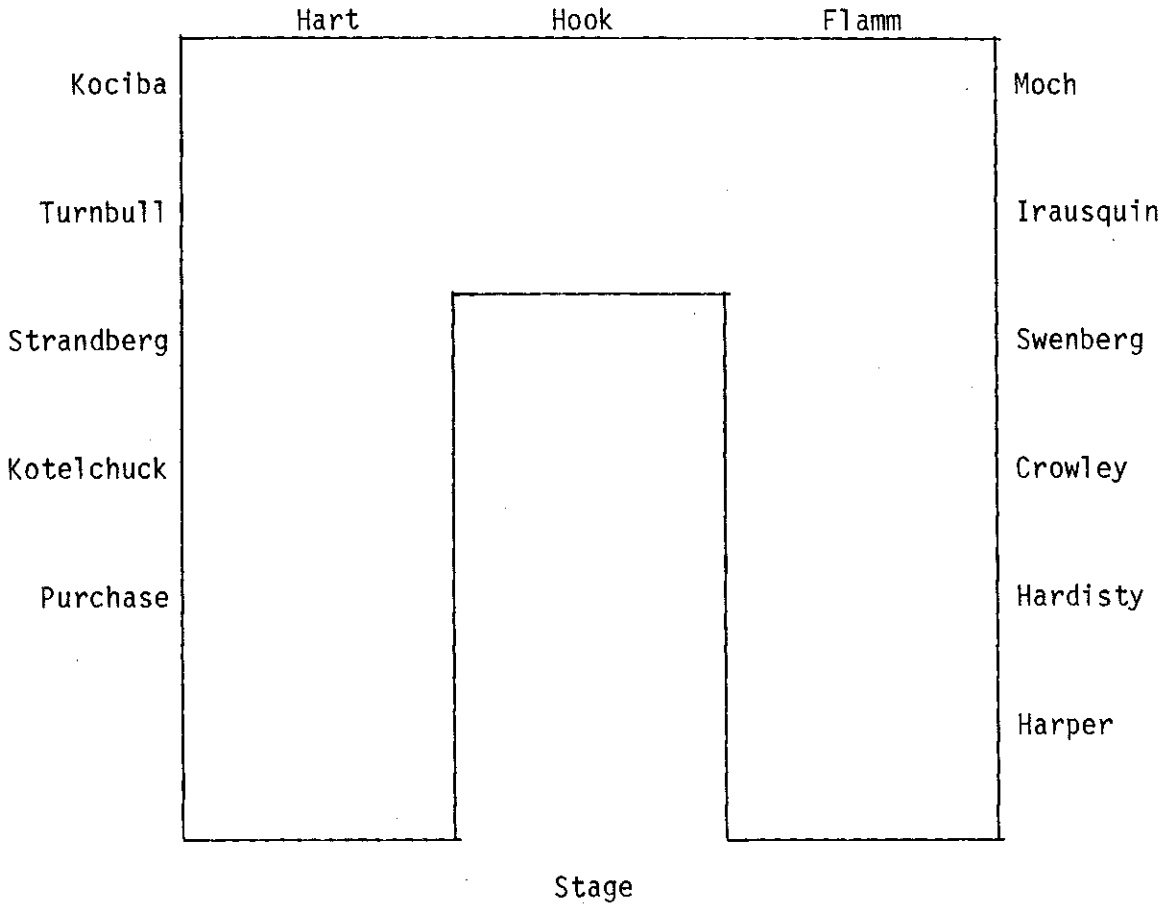
Peer Review of the Data from the Raltech
Lifetime Feeding Study with Irradiated Chicken Meat
In CD-1 Mice
By the Technical Reports Review Subcommittee and Panel of Experts

Overview	Dr. W. G. Flamm, Associate Director for Toxicological Sciences, Center for Food Safety and Applied Nutrition, FDA
Discussion of Toxicology	Dr. H. Irausquin, Review Toxicologist, Food Additives Evaluation Branch, Division of Toxicology, Center for Food Safety and Applied Nutrition, FDA
Discussion of Pathology	Dr. R. W. Moch, Director, Division of Pathology, Center for Food Safety and Applied Nutrition, FDA
Public Comments	
Peer Review Comments on the Pathology	Dr. J. Hardisty Dr. R. Kociba Dr. J. Strandberg Dr. J. Swenberg
Conclusions	Peer Review Panel

NTP PEER REVIEW OF THE DATA FROM THE
LIFETIME FEEDING STUDY WITH IRRADIATED CHICKEN MEAT
IN CD-1 MICE

Conference Center, Building 101
National Institute of Environmental Health Sciences
Research Triangle Park, North Carolina

March 28, 1985



NATIONAL TOXICOLOGY PROGRAM
BOARD OF SCIENTIFIC COUNSELORS
TECHNICAL REPORTS REVIEW SUBCOMMITTEE AND PANEL OF EXPERTS
MARCH 28, 1985

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Amended Table 1

A Comparison of the Diagnoses of Proliferative Testicular Lesions Between the Division of Pathology, Center for Food Safety and Applied Nutrition, Food and Drug Administration and Those Given in the Raltech Report (Pathology Project PR-99); CD-1 Mice (Raltech Experiment Number R9P-36) (USDA Contract Number 53-3K06-1-29)

DP/CFSAN Computer No.	Raltech's Animal I.D. No.	DP's Diagnoses	Raltech's Diagnoses	Any Reported Gross Findings in the Testis	Fate of the Animal
46	N1185	Tumor, NOS[1]	Hemangioma	NVL[2]	Termination (106 wks)
172	F2267	ICT[3]	ICT	White foci, unilat.	Termination (106 wks)
178	F2298	Sertoli Cell tumor	Adenoma, papillary	NVL	Termination (106 wks)
303	T3072	Tumor, NOS	Atrophy, severe, diffuse Fibrosis Calcification	Mass, unilateral	Termination (105 wks)
417	G4066	ICT	ICT	White Foci unilat.	Termination (105 wks)
433	G4148	Hyperplasia, interstitial cell	ICT	NVL	Termination (106 wks)
473	G4163	ICT, malignant	ICT	NVL	Moribund; (69 wks)
476	G4185	ICT	ICT-epididymis	NVL	Moribund (104 wks)
526	E5026	ICT	ICT	Mass, unilateral	Termination (105 wks)
548	E5146	ICT	ICT	White foci	Termination (105 weeks)
564	E5224	ICT	ICT	Testis Enlarged Epididymis Enlarged	Termination (106 wks)
567	E5035	ICT	ICT	NVL	Unknown Death (87 wks)

[1]Not Otherwise Specified [2]No Visible Lesion [3]Interstitial Cell Tumor

Attachment 3

Amended Table 2

Summary Incidence of Testicular Proliferative Lesions According to the Division of Pathology's (Center for Food Safety and Applied Nutrition) Evaluation of Microslides Containing Testicular Tissue. (Pathology Petition Review PR-99--CD-1 Mice Fed Irradiated Chicken)

Group	Tumor, NOS	Sertoli Cell Tumor	Interstitial Cell Tumor	Interstitial Cell Hyperplasia
	%	%	%	%
N	1/105 (1.0)	0/105 (0.0)	0/105 (0.0)	3/105 (2.9)
F	0/159 (0.0)	1/159 (0.6)	1/159 (0.6)	5/159 (3.1)
T	1/109 (0.9)	0/109 (0.0)	0/109 (0.0)	4/109 (3.7)
G	0/107 (0.0)	0/107 (0.0)	3/107 (2.8)	5/107 (4.7)
E	0/106 (0.0)	0/106 (0.0)	4/106 (3.8)	4/106 (3.8)

Amended Table 3

Summary Incidence of Gonadal Stromal Tumors According to the Division of Pathology's (Center for Food Safety and Applied Nutrition) Evaluation of Microslides Containing Testicular Tissue. (Pathology Petition Review PR-99--CD-1 Mice Fed Irradiated Chicken)

Group	Gonadal Stromal Tumor
	%
N	1/105 (1.0)
F	2/159 (1.3)
T	1/109 (0.9)
G	3/107 (2.8)
E	4/106 (3.8)

The historical incidence of testicular tumors (interstitial cell) in male mice of CD-1 strain is less than 1% (Ref. # 8). Although in the Raltech study, there appears to be a small increase in the incidence of animals with testicular interstitial cell tumors in the groups fed gamma irradiated or electron irradiated chicken meat, 3/107, 2.8% and 4/106, 3.8%, as compared to the historical control incidence, the findings of testicular lesions in this study, evaluated either as 'interstitial cell tumors' per se or 'Gonadal Stromal tumors', are considered of spontaneous occurrence and not related to the treatments. This conclusion is based on the following:

1. There was no increase in interstial cell hyperplasia in the testes of these animals.

2. There was no evidence of a progression of testicular lesion(s) from hyperplasia to neoplasia.

3. There were no demonstrable toxic lesions (e.g., atrophy or necrosis) in the testes which could have contributed to the pathogenesis of neoplasia.

4. All the testicular tumors were unilateral, i.e., none of the tumors was bilateral.

5. Only one (1) of the testicular tumors (G4163) was interpreted a malignant tumor.

6. A majority of the tumors were reported in animals at the time of terminal sacrifice (i.e., 2-years of age). Three (3) of the animals with testicular tumors which died before the terminal sacrifice had other lesions also which may have contributed to their early mortality. Animal # G4163 had a reported transitional cell carcinoma of the urinary bladder; animal # G4185 reportedly had hepatocellular carcinoma and a malignant alveologenic lung tumor; animal # E5035 had a reported cavernous hemangiosarcoma of the liver and a malignant alveologenic lung tumor.

7. Cystic vascular interstitial cell tumors mimic other tumors and the reported incidence of interstitial cell tumors is probably not represented fully in the historical control data.

Attachment 4

Consensus Diagnoses of Testicular

Lesions in CD-1 Mice By Peer Review Panel

Pathologists on March 28, 1985

Group	1 Other	2 *ICH (Bilat)	3 ICH/ICT?	4 **ICT	5 Combination Gonadal Stromal Tumors/Hyperplasia
N	(1) Possible Gonadal Stromal Tumor N1185	(2) N1176 N1185	(2) N1163 N1178	0	(3) N1163 N1178 N1185
F	(1) Pap adenoma rete testes F2298	(4+) F2298 F2003 F2191 F2275 plus one not avail.	(1) F2276	(1) F2267	(2) F2276 F2267
T	(1) T3072 Possible Gonadal Stromal Tumor	(3) T3169 T3156 T3184	(2) T3072 T3079	(0)	(2) T3072 T3079
G	0	(4) G4194 G4050 G4164 G4003	(1) G4148	(4) G4198 G4066 G4163 G4185	(5) G4148 G4198 G4066 G4163 G4185
E	0	(4) E5162 E5123 E5181 E5209	(0)	(4) E5026 E5146 E5224 E5035	(4) E5026 E5146 E5224 E5035

*ICH = Interstitial Cell Hyperplasia
**ICT = Interstitial Cell Tumor