

TDMS No. 20009 - 03

**P18: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE (a) WITH
AVERAGE SEVERITY GRADES[b]**

Date Report Requested: 05/27/2011

Test Type: CHRONIC

beta-Picoline

Time Report Requested: 10:09:56

Route: DOSED WATER

CAS Number: 108-99-6

First Dose M/F: 11/18/04 / 11/19/04

Species/Strain: RATS/F 344/N

Lab: BAT

F2_R2

C Number: C20009
Lock Date: 06/05/2008
Cage Range: ALL
Date Range: ALL
Reasons For Removal: ALL
Removal Date Range: ALL
Treatment Groups: Include ALL
Study Gender: Both
TDMSE Version: 2.4.1.0_004
PWG Approval Date: 06/29/2010

Test Type: CHRONIC

beta-Picoline

Time Report Requested: 10:09:56

Route: DOSED WATER

CAS Number: 108-99-6

First Dose M/F: 11/18/04 / 11/19/04

Species/Strain: RATS/F 344/N

Lab: BAT

| FISCHER 344 RATS MALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|-----------------------|--------|-------------|------------|----------|
|-----------------------|--------|-------------|------------|----------|

Disposition Summary

| | | | | |
|----------------------------------|----|----|----|----|
| Animals Initially In Study | 50 | 50 | 50 | 50 |
| Early Deaths | | | | |
| Moribund Sacrifice | 9 | 12 | 15 | 23 |
| Natural Death | 8 | 7 | 3 | 3 |
| Survivors | | | | |
| Terminal Sacrifice | 33 | 31 | 32 | 24 |
| Animals Examined Microscopically | 50 | 50 | 50 | 50 |

ALIMENTARY SYSTEM

| | | | | |
|-----------------------------------|---------|---------|---------|---------|
| Esophagus | (50) | (50) | (50) | (50) |
| Hyperplasia, Squamous | | 1 [1.0] | | |
| Inflammation, Suppurative | 1 [1.0] | | | |
| Intestine Large, Cecum | (45) | (47) | (48) | (48) |
| Inflammation, Chronic Active | | | | 1 [1.0] |
| Necrosis | 1 [2.0] | | | |
| Intestine Large, Colon | (47) | (49) | (49) | (49) |
| Parasite Metazoan | 3 [1.3] | 4 [2.0] | 7 [1.4] | 1 [2.0] |
| Intestine Large, Rectum | (47) | (49) | (49) | (50) |
| Infiltration Cellular, Mixed Cell | | 1 [1.0] | | |
| Parasite Metazoan | 2 [1.5] | 5 [1.4] | 3 [1.7] | 5 [1.8] |
| Intestine Small, Duodenum | (48) | (49) | (49) | (50) |
| Intestine Small, Ileum | (46) | (47) | (48) | (49) |
| Inflammation, Chronic Active | | 1 [1.0] | | |
| Intestine Small, Jejunum | (45) | (47) | (48) | (49) |
| Inflammation, Chronic Active | 1 [1.0] | | | |
| Liver | (50) | (50) | (50) | (50) |
| Angiectasis | 1 [2.0] | | 1 [1.0] | |
| Atrophy | | | 1 [3.0] | |
| Basophilic Focus | 15 | 14 | 16 | 10 |
| Clear Cell Focus | 13 | 23 | 20 | 15 |
| Congestion | | | | 1 [1.0] |
| Degeneration, Cystic | 3 [1.0] | 6 [1.2] | 7 [1.3] | 2 [1.0] |
| Eosinophilic Focus | 7 | 1 | 2 | 5 |

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

beta-Picoline

Time Report Requested: 10:09:56

Route: DOSED WATER

CAS Number: 108-99-6

First Dose M/F: 11/18/04 / 11/19/04

Species/Strain: RATS/F 344/N

Lab: BAT

| FISCHER 344 RATS MALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|------------------------------|----------|-------------|------------|----------|
| Fatty Change | 7 [2.7] | 6 [1.5] | 7 [1.1] | 9 [2.1] |
| Fibrosis | | | 1 [2.0] | |
| Hepatodiaphragmatic Nodule | 4 | 3 | 2 | 6 |
| Inflammation, Chronic Active | | 3 [1.3] | 3 [1.3] | 1 [1.0] |
| Mixed Cell Focus | 6 | 3 | 6 | 3 |
| Necrosis | 2 [1.0] | 3 [2.3] | | 2 [1.5] |
| Vacuolization Cytoplasmic | 15 [1.5] | 12 [1.8] | 12 [1.5] | 16 [1.3] |
| Bile Duct, Hyperplasia | 40 [2.3] | 36 [2.8] | 44 [2.8] | 42 [2.0] |
| Centrilobular, Atrophy | | 1 [3.0] | | |
| Centrilobular, Necrosis | 1 [2.0] | | 1 [2.0] | |
| Periportal, Fibrosis | | 1 [3.0] | | |
| Periportal, Inflammation | 1 [2.0] | | 1 [2.0] | |
| Vein, Dilatation | | 1 [2.0] | | |
| Mesentery | (4) | (8) | (4) | (6) |
| Fat, Necrosis | 1 [2.0] | 6 [1.3] | 3 [1.3] | 5 [1.8] |
| Pancreas | (49) | (50) | (50) | (48) |
| Cyst | 1 [2.0] | | 2 [2.5] | |
| Hyperplasia | 2 [1.5] | | | 1 [1.0] |
| Infiltration Cellular | | 1 [1.0] | 1 [2.0] | |
| Lipomatosis | | | | 1 [1.0] |
| Acinus, Atrophy | 18 [1.3] | 31 [1.6] | 31 [1.4] | 25 [1.7] |
| Salivary Glands | (50) | (50) | (50) | (50) |
| Atrophy | | | 1 [2.0] | |
| Infiltration Cellular | | 1 [1.0] | | |
| Duct, Inflammation | | 1 [2.0] | | |
| Stomach, Forestomach | (50) | (50) | (50) | (50) |
| Angiectasis | | 1 [2.0] | | |
| Edema | | | 1 [3.0] | |
| Erosion | 1 [3.0] | | | |
| Fibrosis | 1 [2.0] | 6 [2.2] | 2 [2.5] | 1 [3.0] |
| Hyperplasia, Squamous | 15 [2.2] | 18 [2.0] | 7 [1.9] | 17 [2.7] |
| Inflammation | | 1 [1.0] | | 2 [1.5] |
| Ulcer | 2 [3.5] | 5 [2.6] | 2 [2.5] | 2 [2.5] |
| Stomach, Glandular | (50) | (50) | (50) | (50) |
| Angiectasis | | 1 [3.0] | | |
| Erosion | 1 [1.0] | 3 [1.3] | | |

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

beta-Picoline

Time Report Requested: 10:09:56

Route: DOSED WATER

CAS Number: 108-99-6

First Dose M/F: 11/18/04 / 11/19/04

Species/Strain: RATS/F 344/N

Lab: BAT

| FISCHER 344 RATS MALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|------------------------------|---------|-------------|------------|----------|
| Fibrosis | 1 [2.0] | | | |
| Hyperplasia | 1 [2.0] | | | |
| Inflammation, Chronic Active | 4 [1.5] | 6 [1.2] | 4 [1.8] | 3 [1.0] |
| Metaplasia, Squamous | | 1 [1.0] | | |
| Ulcer | | | | 2 [1.5] |
| Tongue | (0) | (0) | (2) | (1) |

CARDIOVASCULAR SYSTEM

| | | | | |
|--|----------|----------|----------|----------|
| Blood Vessel | (50) | (50) | (50) | (50) |
| Aorta, Mineralization | | 1 [2.0] | | |
| Heart | (50) | (50) | (50) | (50) |
| Cardiomyopathy | 49 [2.5] | 50 [2.8] | 50 [2.9] | 49 [2.6] |
| Mineralization | | 1 [2.0] | | |
| Atrium, Thrombosis | 5 [2.2] | 5 [2.4] | | |
| Epicardium, Inflammation, Chronic Active | | | | 1 [1.0] |
| Valve, Inflammation, Chronic Active | | 1 [4.0] | | |

ENDOCRINE SYSTEM

| | | | | |
|-----------------------------------|----------|----------|----------|----------|
| Adrenal Cortex | (50) | (50) | (50) | (50) |
| Accessory Adrenal Cortical Nodule | 2 [1.0] | | | 2 [1.0] |
| Hyperplasia | 20 [1.3] | 31 [1.5] | 27 [1.4] | 21 [1.3] |
| Necrosis | 1 [2.0] | | 1 [1.0] | |
| Vacuolization Cytoplasmic | 3 [1.7] | | | 1 [3.0] |
| Adrenal Medulla | (50) | (49) | (49) | (50) |
| Hyperplasia | 12 [1.3] | 18 [1.4] | 13 [1.3] | 7 [1.6] |
| Islets, Pancreatic | (50) | (50) | (50) | (50) |
| Hyperplasia | 1 [2.0] | 1 [1.0] | 1 [2.0] | 1 [2.0] |
| Parathyroid Gland | (50) | (47) | (48) | (48) |
| Hyperplasia | 1 [1.0] | | | |
| Pituitary Gland | (50) | (49) | (50) | (49) |
| Cyst | 2 [1.5] | | 2 [2.0] | |
| Metaplasia, Osseous | 1 [1.0] | | | 1 [1.0] |
| Necrosis | | | | 1 [3.0] |

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

beta-Picoline

Time Report Requested: 10:09:56

Route: DOSED WATER

CAS Number: 108-99-6

First Dose M/F: 11/18/04 / 11/19/04

Species/Strain: RATS/F 344/N

Lab: BAT

| FISCHER 344 RATS MALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|------------------------------|----------|-------------|------------|----------|
| Pars Distalis, Hyperplasia | 16 [1.8] | 11 [1.5] | 19 [1.8] | 12 [2.0] |
| Pars Intermedia, Hyperplasia | | | 1 [1.0] | |
| Pars Nervosa, Hyperplasia | | | 1 [1.0] | |
| Thyroid Gland | (50) | (50) | (50) | (50) |
| Congestion | 1 [1.0] | | | |
| C-cell, Hyperplasia | 6 [1.3] | 4 [2.0] | 11 [1.1] | 7 [1.9] |
| Follicle, Cyst | | 1 [1.0] | | 1 [2.0] |
| Follicular Cell, Hyperplasia | | 1 [1.0] | 1 [1.0] | |

GENERAL BODY SYSTEM

| | | | | |
|------------------------------|-----|-----|-----|---------|
| Peritoneum | (2) | (1) | (1) | (2) |
| Inflammation, Chronic Active | | | | 1 [1.0] |

GENITAL SYSTEM

| | | | | |
|--------------------------------|----------|----------|----------|----------|
| Epididymis | (50) | (50) | (50) | (50) |
| Degeneration, Fatty | | 1 [2.0] | | |
| Inflammation, Chronic Active | | | 2 [3.0] | 2 [1.0] |
| Preputial Gland | (50) | (50) | (50) | (50) |
| Cyst | | 1 [2.0] | 1 [2.0] | |
| Hyperplasia, Squamous | | 1 [3.0] | | |
| Inflammation | 15 [1.7] | 10 [1.4] | 10 [1.3] | 13 [1.6] |
| Prostate | (49) | (50) | (50) | (50) |
| Hyperplasia | 1 [1.0] | | | 1 [2.0] |
| Hyperplasia, Adenomatous | 1 [2.0] | | | 1 [1.0] |
| Inflammation | 31 [1.7] | 45 [1.6] | 45 [1.7] | 35 [1.6] |
| Seminal Vesicle | (50) | (50) | (50) | (50) |
| Dilatation | | 1 [3.0] | | |
| Inflammation | | | 2 [2.0] | 1 [1.0] |
| Testes | (50) | (50) | (50) | (50) |
| Atrophy | 3 [3.3] | 9 [2.9] | 5 [2.4] | 3 [3.3] |
| Inflammation, Chronic Active | 1 [2.0] | | | |
| Interstitial Cell, Hyperplasia | 12 [1.3] | 18 [1.1] | 17 [1.1] | 13 [1.1] |

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

beta-Picoline

Time Report Requested: 10:09:56

Route: DOSED WATER

CAS Number: 108-99-6

First Dose M/F: 11/18/04 / 11/19/04

Species/Strain: RATS/F 344/N

Lab: BAT

| FISCHER 344 RATS MALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|-----------------------|--------|-------------|------------|----------|
|-----------------------|--------|-------------|------------|----------|

HEMATOPOIETIC SYSTEM

| | | | | |
|--|---------|---------|---------|---------|
| Bone Marrow | (50) | (50) | (50) | (50) |
| Lymph Node | (9) | (11) | (11) | (8) |
| Congestion | 1 [3.0] | | | |
| Hyperplasia, Lymphoid | 1 [3.0] | | | |
| Deep Cervical, Ectasia | | | | 1 [2.0] |
| Deep Cervical, Hemorrhage | | 1 [2.0] | | |
| Deep Cervical, Infiltration Cellular | | | | 1 [2.0] |
| Mediastinal, Congestion | 1 [3.0] | | | |
| Mediastinal, Ectasia | 1 [4.0] | 1 [3.0] | 4 [3.3] | 3 [2.3] |
| Mediastinal, Hemorrhage | | | 1 [2.0] | |
| Mediastinal, Hyperplasia | 1 [3.0] | 1 [2.0] | 1 [3.0] | |
| Mediastinal, Infiltration Cellular, Mixed Cell | | 1 [2.0] | | |
| Lymph Node, Mesenteric | (50) | (50) | (50) | (50) |
| Congestion | 1 [3.0] | | | |
| Ectasia | | 2 [1.5] | 2 [1.0] | |
| Inflammation, Granulomatous | | | 1 [1.0] | |
| Spleen | (50) | (50) | (50) | (50) |
| Hematopoietic Cell Proliferation | 1 [3.0] | | | |
| Hyperplasia, Lymphoid | | 1 [3.0] | | |
| Inflammation, Granulomatous | | | 1 [3.0] | |
| Necrosis | | | | 1 [2.0] |
| Capsule, Hemorrhage | | 1 [2.0] | | |
| Capsule, Hyperplasia | | | | 1 [1.0] |
| Lymphoid Follicle, Depletion Cellular | | 1 [3.0] | | |
| Lymphoid Follicle, Hyperplasia | 1 [4.0] | | | |
| Thymus | (49) | (49) | (45) | (50) |

INTEGUMENTARY SYSTEM

| | | | | |
|---------------|----------|---------|---------|----------|
| Mammary Gland | (50) | (49) | (50) | (50) |
| Galactocele | 12 [1.4] | 7 [1.1] | 9 [1.7] | 12 [1.4] |
| Hyperplasia | 3 [1.3] | 6 [1.2] | | 5 [1.4] |

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

beta-Picoline

Time Report Requested: 10:09:56

Route: DOSED WATER

CAS Number: 108-99-6

First Dose M/F: 11/18/04 / 11/19/04

Species/Strain: RATS/F 344/N

Lab: BAT

| FISCHER 344 RATS MALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|-----------------------|--------|-------------|------------|----------|
|-----------------------|--------|-------------|------------|----------|

| | | | | |
|---|---------|---------|------|---------|
| Inflammation | | 1 [1.0] | | |
| Skin | (50) | (50) | (50) | (50) |
| Cyst Epithelial Inclusion | 1 [2.0] | | | |
| Hyperplasia, Squamous | 2 [2.5] | | | |
| Inflammation, Suppurative | 1 [2.0] | | | |
| Inflammation, Chronic Active | 1 [3.0] | 1 [3.0] | | |
| Subcutaneous Tissue, Infiltration Cellular, Mixed Cell | | 1 [1.0] | | |
| Subcutaneous Tissue, Inflammation, Chronic Active | | | | 1 [3.0] |

MUSCULOSKELETAL SYSTEM

| | | | | |
|------------------------------|---------|---------|------|---------|
| Bone | (50) | (50) | (50) | (50) |
| Hyperostosis | 1 [1.0] | | | 1 [1.0] |
| Inflammation, Chronic Active | | 1 [3.0] | | |
| Skeletal Muscle | (0) | (0) | (0) | (1) |

NERVOUS SYSTEM

| | | | | |
|-------------|---------|---------|---------|---------|
| Brain | (50) | (50) | (50) | (50) |
| Compression | 5 [2.6] | 9 [2.7] | 8 [2.3] | 9 [2.6] |
| Hemorrhage | 1 [2.0] | | 2 [2.0] | 3 [2.3] |

RESPIRATORY SYSTEM

| | | | | |
|--|----------|----------|----------|---------|
| Lung | (50) | (50) | (50) | (50) |
| Foreign Body | | | | 1 [1.0] |
| Inflammation, Suppurative | 1 [2.0] | | | |
| Inflammation, Granulomatous | | | | 1 [2.0] |
| Alveolar Epithelium, Hyperplasia | 12 [1.3] | 11 [1.5] | 12 [1.0] | 8 [1.5] |
| Alveolar Epithelium, Metaplasia, Squamous | | 1 [1.0] | | |
| Perivascular, Hemorrhage | | | 1 [2.0] | 1 [2.0] |
| Perivascular, Inflammation, Chronic Active | 1 [3.0] | | | |
| Nose | (50) | (50) | (50) | (50) |

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

beta-Picoline

Time Report Requested: 10:09:56

Route: DOSED WATER

CAS Number: 108-99-6

First Dose M/F: 11/18/04 / 11/19/04

Species/Strain: RATS/F 344/N

Lab: BAT

| FISCHER 344 RATS MALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|--|----------|-------------|------------|----------|
| Edema | | | | 1 [2.0] |
| Foreign Body | 10 [1.4] | 20 [1.5] | 15 [1.5] | 10 [1.6] |
| Inflammation | 21 [2.0] | 23 [2.0] | 16 [1.9] | 24 [2.0] |
| Mineralization | | 1 [1.0] | | |
| Necrosis | 1 [2.0] | | | |
| Glands, Cyst | | | | 1 [1.0] |
| Nasolacrimal Duct, Foreign Body | | | 1 [1.0] | |
| Nasolacrimal Duct, Hyperplasia, Squamous | | | 1 [1.0] | |
| Nasolacrimal Duct, Inflammation | 1 [2.0] | | 1 [1.0] | |
| Olfactory Epithelium, Atrophy | | | | 1 [1.0] |
| Olfactory Epithelium, Erosion | | | | 1 [2.0] |
| Olfactory Epithelium, Metaplasia | | | 1 [1.0] | 1 [2.0] |
| Olfactory Epithelium, Necrosis | | | | 1 [2.0] |
| Respiratory Epithelium, Degeneration, Cystic | 1 [2.0] | | | |
| Respiratory Epithelium, Erosion | | | | 1 [3.0] |
| Respiratory Epithelium, Hyperplasia | 14 [1.9] | 20 [1.8] | 15 [1.6] | 17 [1.9] |
| Respiratory Epithelium, Metaplasia, Squamous | | 1 [1.0] | | |
| Respiratory Epithelium, Ulcer | 2 [2.0] | | | |
| Squamous Epithelium, Hyperplasia | | 1 [2.0] | 1 [1.0] | |
| Trachea | (49) | (50) | (50) | (50) |
| Amyloid Deposition | 1 [2.0] | | | |
| Inflammation | | | | 1 [1.0] |
| Glands, Cyst | 2 [1.0] | | | |

SPECIAL SENSES SYSTEM

| | | | | |
|--------------------------------------|---------|---------|---------|---------|
| Ear | (2) | (0) | (0) | (0) |
| Cyst | 1 [1.0] | | | |
| Hyperplasia, Squamous | 1 [4.0] | | | |
| Eye | (50) | (50) | (50) | (50) |
| Cataract | 2 [1.5] | 3 [1.3] | 1 [4.0] | 3 [1.7] |
| Cornea, Hyperplasia, Squamous | | | 2 [1.5] | |
| Cornea, Inflammation, Chronic Active | 1 [3.0] | | | 1 [1.0] |
| Retina, Degeneration | | 1 [1.0] | 1 [4.0] | 1 [3.0] |
| Sclera, Inflammation, Chronic Active | 1 [3.0] | | | 1 [2.0] |

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

beta-Picoline

Time Report Requested: 10:09:56

Route: DOSED WATER

CAS Number: 108-99-6

First Dose M/F: 11/18/04 / 11/19/04

Species/Strain: RATS/F 344/N

Lab: BAT

| FISCHER 344 RATS MALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|-----------------------|---------|-------------|------------|----------|
| Harderian Gland | (50) | (50) | (50) | (50) |
| Hyperplasia | 1 [1.0] | | 2 [1.5] | |
| Zymbal's Gland | (1) | (0) | (1) | (1) |

URINARY SYSTEM

| | | | | |
|---|----------|----------|----------|----------|
| Kidney | (50) | (50) | (50) | (50) |
| Accumulation, Hyaline Droplet | | | | 1 [4.0] |
| Dilatation | | 1 [1.0] | | |
| Infarct, Acute | | 1 [2.0] | 1 [3.0] | 1 [1.0] |
| Metaplasia, Osseous | | 1 [1.0] | | |
| Nephropathy | 48 [3.0] | 50 [3.3] | 50 [3.2] | 50 [2.4] |
| Medulla, Renal Tubule, Necrosis | | 1 [2.0] | | |
| Pelvis, Inflammation, Chronic Active | | 1 [1.0] | 2 [2.5] | |
| Renal Tubule, Hyperplasia | | 1 [2.0] | | 1 [2.0] |
| Urinary Bladder | (50) | (50) | (50) | (50) |
| Hemorrhage | | 1 [2.0] | | |
| Infiltration Cellular, Mixed Cell, Chronic Active | | | | 1 [1.0] |
| Inflammation, Suppurative | | 1 [4.0] | | |
| Transitional Epithelium, Hyperplasia | | 1 [2.0] | | |

*** END OF MALE ***

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC
 Route: DOSED WATER
 Species/Strain: RATS/F 344/N

beta-Picoline
 CAS Number: 108-99-6

Time Report Requested: 10:09:56
 First Dose M/F: 11/18/04 / 11/19/04
 Lab: BAT

| FISCHER 344 RATS FEMALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|-------------------------|--------|-------------|------------|----------|
|-------------------------|--------|-------------|------------|----------|

Disposition Summary

| | | | | |
|----------------------------------|----|----|----|----|
| Animals Initially In Study | 50 | 50 | 50 | 50 |
| Early Deaths | | | | |
| Moribund Sacrifice | 15 | 13 | 14 | 15 |
| Natural Death | 5 | 5 | 3 | 5 |
| Survivors | | | | |
| Natural Death | 1 | | | |
| Terminal Sacrifice | 29 | 32 | 33 | 30 |
| Animals Examined Microscopically | 50 | 50 | 50 | 50 |

ALIMENTARY SYSTEM

| | | | | |
|------------------------------|---------|---------|---------|---------|
| Esophagus | (50) | (50) | (50) | (50) |
| Intestine Large, Cecum | (46) | (45) | (47) | (45) |
| Inflammation, Chronic Active | 1 [1.0] | | | |
| Intestine Large, Colon | (47) | (48) | (50) | (49) |
| Inflammation, Chronic Active | | 1 [1.0] | | |
| Parasite Metazoan | 3 [1.3] | 2 [1.5] | 2 [1.0] | 1 [2.0] |
| Intestine Large, Rectum | (47) | (48) | (50) | (49) |
| Inflammation, Chronic Active | | 1 [1.0] | 1 [1.0] | |
| Parasite Metazoan | 3 [2.0] | 8 [1.7] | 1 [2.0] | 7 [1.4] |
| Intestine Small, Duodenum | (50) | (47) | (50) | (50) |
| Intestine Small, Ileum | (47) | (46) | (49) | (50) |
| Inflammation, Chronic Active | 1 [1.0] | 1 [2.0] | 1 [1.0] | |
| Parasite Metazoan | | | | 1 [1.0] |
| Intestine Small, Jejunum | (48) | (46) | (47) | (48) |
| Inflammation, Chronic Active | 1 [1.0] | | 2 [2.0] | 1 [2.0] |
| Liver | (50) | (50) | (50) | (50) |
| Angiectasis | | 3 [1.3] | 1 [1.0] | |
| Atypia Cellular | | | 1 [2.0] | |
| Basophilic Focus | 37 | 41 | 46 | 45 |
| Clear Cell Focus | 10 | 12 | 12 | 10 |
| Congestion | 1 [2.0] | 1 [1.0] | | 1 [1.0] |
| Degeneration, Cystic | 1 [2.0] | | | |
| Eosinophilic Focus | 12 | 14 | 12 | 13 |

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

beta-Picoline

Time Report Requested: 10:09:56

Route: DOSED WATER

CAS Number: 108-99-6

First Dose M/F: 11/18/04 / 11/19/04

Species/Strain: RATS/F 344/N

Lab: BAT

| FISCHER 344 RATS FEMALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|---|----------|-------------|------------|----------|
| Fatty Change | 8 [1.8] | 7 [1.6] | 8 [1.4] | 11 [1.2] |
| Fatty Change, Focal | 2 [3.5] | 13 [2.3] | 7 [2.3] | 8 [2.4] |
| Hematopoietic Cell Proliferation | 1 [1.0] | | | |
| Hepatodiaphragmatic Nodule | 2 | 7 | 3 | 1 |
| Inflammation, Chronic Active | 2 [1.5] | 4 [1.5] | 3 [1.0] | |
| Mixed Cell Focus | 1 | 2 | 1 | 3 |
| Necrosis | 1 [1.0] | | 2 [1.5] | |
| Regeneration | 1 [2.0] | | | |
| Vacuolization Cytoplasmic | 4 [1.5] | 1 [2.0] | 2 [2.0] | |
| Bile Duct, Hyperplasia | 10 [1.8] | 2 [2.0] | 9 [1.4] | 7 [1.7] |
| Serosa, Fibrosis | | | 1 [1.0] | 2 [1.5] |
| Vein, Dilatation | 1 [2.0] | | | 1 [2.0] |
| Vein, Infiltration Cellular, Mixed Cell | | 1 [2.0] | | |
| Mesentery | (4) | (7) | (7) | (8) |
| Fibrosis | | | | 1 [2.0] |
| Fat, Necrosis | 4 [1.8] | 6 [1.7] | 6 [1.2] | 7 [1.1] |
| Oral Mucosa | (0) | (0) | (1) | (2) |
| Gingival, Foreign Body | | | 1 [2.0] | 1 [2.0] |
| Gingival, Inflammation, Chronic Active | | | 1 [2.0] | |
| Pancreas | (50) | (50) | (49) | (50) |
| Atrophy | | | 1 [3.0] | 1 [3.0] |
| Basophilic Focus | 1 | | 2 | |
| Cyst | 1 [2.0] | 2 [1.5] | | |
| Infiltration Cellular | 2 [2.0] | | | 1 [1.0] |
| Salivary Glands | (50) | (50) | (50) | (50) |
| Atrophy | | 1 [2.0] | 1 [2.0] | |
| Stomach, Forestomach | (50) | (50) | (50) | (50) |
| Edema | | | 1 [2.0] | |
| Fibrosis | 4 [2.0] | 1 [2.0] | 4 [2.0] | 1 [3.0] |
| Hyperplasia, Basal Cell, Focal | | | 1 [1.0] | |
| Hyperplasia, Squamous | 7 [2.0] | 5 [2.2] | 6 [1.8] | 7 [2.0] |
| Inflammation | 1 [1.0] | | 1 [2.0] | |
| Ulcer | 1 [2.0] | 2 [2.5] | 3 [2.3] | |
| Stomach, Glandular | (50) | (50) | (49) | (50) |
| Inflammation, Chronic Active | 1 [1.0] | 1 [1.0] | 1 [2.0] | 1 [1.0] |
| Mineralization | | | | 2 [2.0] |

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC
 Route: DOSED WATER
 Species/Strain: RATS/F 344/N

beta-Picoline
 CAS Number: 108-99-6

Time Report Requested: 10:09:56
 First Dose M/F: 11/18/04 / 11/19/04
 Lab: BAT

| FISCHER 344 RATS FEMALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|---|----------|-------------|------------|----------|
| Ulcer | 1 [2.0] | | | |
| Tongue | (0) | (0) | (0) | (1) |
| CARDIOVASCULAR SYSTEM | | | | |
| Blood Vessel | (50) | (50) | (50) | (50) |
| Aorta, Mineralization | | | | 1 [2.0] |
| Heart | (50) | (50) | (50) | (50) |
| Cardiomyopathy | 48 [2.3] | 50 [2.5] | 50 [2.6] | 49 [2.6] |
| Mineralization | | | | 2 [4.0] |
| Artery, Infiltration Cellular, Mononuclear Cell | 1 [2.0] | | | |
| Atrium, Thrombosis | 1 [2.0] | 1 [2.0] | | |
| Endocardium, Hyperplasia | | | 1 [3.0] | |
| ENDOCRINE SYSTEM | | | | |
| Adrenal Cortex | (50) | (50) | (50) | (50) |
| Accessory Adrenal Cortical Nodule | 1 [1.0] | 1 [1.0] | | 1 [1.0] |
| Amyloid Deposition | | 1 [2.0] | | |
| Hyperplasia | 26 [1.7] | 25 [1.4] | 34 [1.4] | 22 [1.5] |
| Necrosis | 2 [2.0] | 1 [1.0] | 1 [2.0] | 1 [2.0] |
| Vacuolization Cytoplasmic | 2 [2.0] | 1 [2.0] | 1 [3.0] | 1 [2.0] |
| Adrenal Medulla | (50) | (50) | (50) | (50) |
| Hyperplasia | 5 [1.0] | 3 [1.0] | 1 [1.0] | 3 [1.0] |
| Islets, Pancreatic | (50) | (49) | (50) | (50) |
| Hyperplasia | | | | 1 [1.0] |
| Parathyroid Gland | (47) | (49) | (48) | (48) |
| Hyperplasia | | | | 1 [1.0] |
| Pituitary Gland | (50) | (49) | (49) | (50) |
| Angiectasis | | 1 [2.0] | | |
| Cyst | | | 1 [1.0] | |
| Pars Distalis, Cyst | 1 | 1 | | 1 |
| Pars Distalis, Hyperplasia | 19 [2.3] | 19 [1.6] | 20 [1.8] | 20 [2.0] |
| Pars Intermedia, Hyperplasia | 1 [1.0] | | | |
| Thyroid Gland | (50) | (48) | (50) | (50) |

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

beta-Picoline

Time Report Requested: 10:09:56

Route: DOSED WATER

CAS Number: 108-99-6

First Dose M/F: 11/18/04 / 11/19/04

Species/Strain: RATS/F 344/N

Lab: BAT

| FISCHER 344 RATS FEMALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|-------------------------|---------|-------------|------------|----------|
| Mineralization | | | | 1 [2.0] |
| C-cell, Hyperplasia | 8 [1.5] | 6 [1.5] | 5 [2.4] | 7 [1.6] |
| Follicle, Cyst | | 1 [1.0] | 1 [1.0] | |

GENERAL BODY SYSTEM

| | | | | |
|------------|-----|-----|-----|-----|
| Peritoneum | (0) | (1) | (0) | (0) |
|------------|-----|-----|-----|-----|

GENITAL SYSTEM

| | | | | |
|----------------------------------|---------|---------|---------|---------|
| Clitoral Gland | (50) | (50) | (50) | (50) |
| Cyst | 1 [2.0] | 1 [3.0] | 2 [2.0] | 1 [3.0] |
| Fibrosis | 1 [2.0] | | 1 [2.0] | 1 [2.0] |
| Hyperplasia | 2 [2.0] | 4 [2.3] | 3 [2.7] | 4 [2.8] |
| Inflammation | 9 [2.0] | 5 [2.8] | 6 [1.8] | 6 [2.2] |
| Duct, Dilatation | | 1 [4.0] | | |
| Ovary | (50) | (50) | (50) | (50) |
| Atrophy | | 1 [3.0] | | 1 [3.0] |
| Cyst | 4 [1.5] | 3 [2.0] | | 3 [1.3] |
| Uterus | (50) | (50) | (50) | (50) |
| Hemorrhage | | 1 [2.0] | | |
| Inflammation, Suppurative | | 1 [4.0] | | |
| Cervix, Cyst | 4 [2.8] | 2 [3.0] | 3 [2.7] | 3 [2.7] |
| Endometrium, Hyperplasia, Cystic | 1 [3.0] | 8 [1.1] | 7 [1.6] | 8 [2.0] |
| Vagina | (1) | (1) | (0) | (2) |

HEMATOPOIETIC SYSTEM

| | | | | |
|--|------|---------|---------|------|
| Bone Marrow | (50) | (50) | (50) | (50) |
| Fibrosis | | 1 [3.0] | | |
| Lymph Node | (5) | (7) | (5) | (2) |
| Deep Cervical, Ectasia | | | 1 [3.0] | |
| Deep Cervical, Hemorrhage | | 1 [3.0] | | |
| Deep Cervical, Infiltration Cellular, Histiocyte | | | 1 [2.0] | |

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

beta-Picoline

Time Report Requested: 10:09:56

Route: DOSED WATER

CAS Number: 108-99-6

First Dose M/F: 11/18/04 / 11/19/04

Species/Strain: RATS/F 344/N

Lab: BAT

| FISCHER 344 RATS FEMALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|--|---------|-------------|------------|----------|
| Mediastinal, Ectasia | | 1 [2.0] | | |
| Mediastinal, Hemorrhage | | 1 [1.0] | | 1 [2.0] |
| Mediastinal, Hyperplasia | | 1 [2.0] | | |
| Mediastinal, Infiltration Cellular, Histiocyte | | | | 1 [2.0] |
| Mediastinal, Infiltration Cellular, Mixed Cell | | | 1 [2.0] | |
| Pancreatic, Ectasia | 1 [3.0] | | | |
| Lymph Node, Mesenteric | (50) | (50) | (50) | (50) |
| Ectasia | | | 1 [2.0] | |
| Infiltration Cellular, Mast Cell | | | 1 [1.0] | |
| Infiltration Cellular, Mononuclear Cell | | | 1 [2.0] | |
| Infiltration Cellular, Plasma Cell | | | | 1 [2.0] |
| Spleen | (50) | (50) | (50) | (50) |
| Angiectasis | | | 1 [2.0] | |
| Atrophy | | | 1 [2.0] | 2 [3.0] |
| Degeneration, Cystic, Focal | | | 1 [1.0] | |
| Hyperplasia, Lymphoid | 4 [3.8] | 2 [2.0] | 1 [3.0] | |
| Necrosis | | 1 [2.0] | | 1 [2.0] |
| Thymus | (49) | (50) | (50) | (47) |
| Cyst | 1 [2.0] | | | 1 [2.0] |
| Fibrosis | | | | 1 [2.0] |
| Hyperplasia, Lymphoid | 1 [4.0] | | | |
| Inflammation, Suppurative | | | | 1 [3.0] |

INTEGUMENTARY SYSTEM

| | | | | |
|--------------------------------|----------|---------|---------|---------|
| Mammary Gland | (50) | (50) | (50) | (50) |
| Galactocele | 12 [1.8] | 8 [1.9] | 3 [1.3] | 4 [1.8] |
| Hyperplasia | 4 [1.3] | 4 [1.5] | 6 [1.8] | 4 [2.0] |
| Inflammation | 1 [1.0] | | | |
| Skin | (50) | (50) | (50) | (50) |
| Fibrosis | 1 [1.0] | | 1 [3.0] | |
| Hyperplasia, Squamous | | | 1 [1.0] | |
| Inflammation, Chronic Active | | 1 [1.0] | | |
| Ulcer | | 2 [2.5] | 2 [3.5] | 1 [2.0] |
| Lip, Inflammation, Suppurative | | | | 1 [1.0] |

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

beta-Picoline

Time Report Requested: 10:09:56

Route: DOSED WATER

CAS Number: 108-99-6

First Dose M/F: 11/18/04 / 11/19/04

Species/Strain: RATS/F 344/N

Lab: BAT

| FISCHER 344 RATS FEMALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|-------------------------|--------|-------------|------------|----------|
|-------------------------|--------|-------------|------------|----------|

MUSCULOSKELETAL SYSTEM

| | | | | |
|------------------------------|---------|------|------|---------|
| Bone | (50) | (50) | (50) | (50) |
| Cyst | | | | 1 [3.0] |
| Hyperostosis | 1 [3.0] | | | |
| Inflammation, Chronic Active | 1 [3.0] | | | 1 [3.0] |
| Skeletal Muscle | (0) | (1) | (0) | (0) |

NERVOUS SYSTEM

| | | | | |
|------------------------------|----------|---------|---------|---------|
| Brain | (50) | (50) | (50) | (50) |
| Compression | 13 [2.3] | 7 [1.7] | 7 [1.9] | 9 [2.9] |
| Hemorrhage | | 2 [2.5] | | 1 [3.0] |
| Inflammation, Chronic Active | | 1 [3.0] | | |

RESPIRATORY SYSTEM

| | | | | |
|---|---------|----------|----------|----------|
| Lung | (50) | (50) | (50) | (50) |
| Fibrosis | | | | 1 [2.0] |
| Foreign Body | 1 [1.0] | | | |
| Inflammation, Suppurative | | | 1 [1.0] | |
| Inflammation, Granulomatous | 1 [1.0] | | 1 [2.0] | |
| Inflammation, Chronic Active | 1 [3.0] | | | |
| Metaplasia, Squamous | 1 [2.0] | | | |
| Pigmentation | 1 [2.0] | | | |
| Thrombosis | | | | 1 [2.0] |
| Alveolar Epithelium, Hyperplasia | 7 [1.3] | 14 [1.5] | 14 [2.1] | 11 [1.2] |
| Alveolar Epithelium, Metaplasia, Squamous | | 3 [1.3] | 1 [2.0] | 1 [1.0] |
| Bronchiole, Inflammation, Suppurative | | | 1 [1.0] | |
| Bronchiole, Inflammation, Chronic Active | | | 2 [1.0] | |
| Serosa, Fibrosis | | 1 [1.0] | | 2 [1.5] |
| Serosa, Inflammation, Granulomatous | | | 1 [1.0] | |
| Nose | (50) | (50) | (50) | (50) |

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

beta-Picoline

Time Report Requested: 10:09:56

Route: DOSED WATER

CAS Number: 108-99-6

First Dose M/F: 11/18/04 / 11/19/04

Species/Strain: RATS/F 344/N

Lab: BAT

| FISCHER 344 RATS FEMALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|-------------------------------------|---------|-------------|------------|----------|
| Foreign Body | 2 [1.0] | 3 [1.7] | 3 [2.3] | 2 [1.5] |
| Inflammation | 3 [1.0] | 5 [1.4] | 4 [2.0] | 3 [1.7] |
| Glands, Hyperplasia | | 1 [1.0] | | |
| Nasolacrimal Duct, Foreign Body | 1 [1.0] | | | |
| Nasolacrimal Duct, Inflammation | 2 [1.0] | | | |
| Olfactory Epithelium, Atrophy | | 1 [1.0] | | |
| Olfactory Epithelium, Metaplasia | | 1 [2.0] | | |
| Respiratory Epithelium, Hyperplasia | 3 [1.7] | 1 [1.0] | 1 [2.0] | 2 [1.5] |
| Turbinate, Cyst | | | | 2 [2.5] |
| Trachea | (50) | (50) | (50) | (50) |
| Infiltration Cellular, Mixed Cell | | 1 [1.0] | | |

SPECIAL SENSES SYSTEM

| | | | | |
|---|---------|----------|----------|----------|
| Eye | (50) | (48) | (48) | (50) |
| Atrophy | 1 [3.0] | | | |
| Cataract | 8 [2.3] | 13 [2.2] | 14 [2.1] | 10 [2.1] |
| Anterior Chamber, Inflammation, Suppurative | | 1 [2.0] | | 1 [2.0] |
| Cornea, Edema | | | 1 [1.0] | |
| Cornea, Hyperplasia | | 1 [1.0] | | |
| Cornea, Inflammation, Chronic Active | 2 [2.5] | | 1 [4.0] | |
| Retina, Degeneration | 1 [4.0] | 2 [3.5] | 4 [3.5] | 3 [2.7] |
| Harderian Gland | (50) | (50) | (50) | (50) |
| Hyperplasia | | | 2 [1.0] | 1 [1.0] |
| Inflammation, Granulomatous | 1 [1.0] | | | |
| Inflammation, Chronic Active | 2 [2.0] | 1 [2.0] | | |
| Zymbal's Gland | (0) | (0) | (2) | (1) |

URINARY SYSTEM

| | | | | |
|---------------------|---------|---------|---------|----------|
| Kidney | (49) | (50) | (50) | (50) |
| Cyst | | | 2 [1.5] | |
| Degeneration, Fatty | 1 [2.0] | | | |
| Dilatation | | | | 1 [1.0] |
| Fibrosis | 8 [2.1] | 7 [2.9] | 8 [3.8] | 10 [3.1] |

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)

Test Type: CHRONIC

beta-Picoline

Time Report Requested: 10:09:56

Route: DOSED WATER

CAS Number: 108-99-6

First Dose M/F: 11/18/04 / 11/19/04

Species/Strain: RATS/F 344/N

Lab: BAT

| FISCHER 344 RATS FEMALE | 0 mg/l | 156.25 mg/l | 312.5 mg/l | 625 mg/l |
|---------------------------------------|----------|-------------|------------|----------|
| Infarct | 7 [1.9] | 8 [1.9] | 4 [2.0] | 5 [1.8] |
| Mineralization | | | | 2 [3.0] |
| Nephropathy | 47 [1.7] | 50 [2.0] | 48 [2.3] | 50 [2.3] |
| Papilla, Hemorrhage | 1 [1.0] | | 5 [1.4] | 1 [2.0] |
| Pelvis, Inflammation, Chronic Active | 8 [2.4] | 9 [3.1] | 8 [3.4] | 10 [3.0] |
| Pelvis, Metaplasia, Squamous | | | 1 [4.0] | |
| Urinary Bladder | (50) | (50) | (50) | (50) |
| Infiltration Cellular, Chronic Active | | | 1 [1.0] | |
| Transitional Epithelium, Hyperplasia | | | 1 [4.0] | |

*** END OF REPORT ***

a - Number of animals examined microscopically at site and number of animals with lesion

b-Average severity grade(1-minimal;2-mild;3-moderate;4-marked)