

Experiment Number: 20725 - 02
Test Type: 90-DAY
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 04/29/2016
Time Report Requested: 14:39:21
First Dose M/F: 07/28/08 / 07/28/08
Lab: BNW

F1_Rev.1_M3

NTP Study Number: C20725
Lock Date: 02/27/2009
Cage Range: ALL
Date Range: ALL
Reasons For Removal: ALL
Removal Date Range: ALL
Treatment Groups: Include ALL
Study Gender: Both
TDMSE Version: 3.0.2.3_002
PWG Approval Date: NONE

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B6C3F1 MICE MALE CONTROL	DAY ON TEST	0	0	0	0	0	0	0	0	0	0	ANIMAL ID	
		0	0	0	0	0	0	0	0	0	0		
		9	9	9	9	9	9	9	9	9	9		
		5	5	5	5	5	5	5	5	5	5		
		0	0	0	0	0	0	0	0	0	0		
		0	0	0	0	0	0	0	0	0	0		
		0	0	0	0	0	0	0	0	0	0		
		0	0	0	0	0	0	0	0	0	1		
		1	2	3	4	5	6	7	8	9	0		* TOTALS

ALIMENTARY SYSTEM

Esophagus	+	+	+	+	+	+	+	+	+	+		10
Gallbladder	+	+	+	M	+	+	+	+	I	+		8
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	+		10
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	+		10
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	+		10
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	+		10
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+		10
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	+		10
Liver	+	+	+	+	+	+	+	+	+	+		10
Inflammation, Chronic Active								1	1			2 1.0
Pancreas	+	+	+	+	+	+	+	+	+	+		10
Salivary Glands	+	+	+	+	+	+	+	+	+	+		10
Stomach, Forestomach	+	+	+	+	+	+	+	+	+	+		10
Stomach, Glandular	+	+	+	+	+	+	+	+	+	+		10

CARDIOVASCULAR SYSTEM

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	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		5	5	5	5	5	5	5	5	5	
		0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	1	
		1	2	3	4	5	6	7	8	9	0
											* TOTALS
Blood Vessel		+	+	+	+	+	+	+	+	+	10
Heart		+	+	+	+	+	+	+	+	+	10
ENDOCRINE SYSTEM											
Adrenal Cortex		+	+	+	+	+	+	+	+	+	10
Accessory Adrenal Cortical Nodule							1				1 1.0
Adrenal Medulla		+	+	+	+	+	+	+	+	+	10
Islets, Pancreatic		+	+	+	+	+	+	+	+	+	10
Parathyroid Gland		+	+	M	M	M	M	M	+	M	3
Pituitary Gland		+	+	+	+	+	+	+	+	+	10
Thyroid Gland		+	+	+	+	+	+	+	+	+	10
GENERAL BODY SYSTEM											
NONE											
GENITAL SYSTEM											
Epididymis		+	+	+	+	+	+	+	+	+	10
Preputial Gland		+	+	+	+	+	+	+	+	+	10
Prostate		+	+	+	+	+	+	+	+	+	10

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		9	9	9	9	9	9	9	9	9	
		5	5	5	5	5	5	5	5	5	
		0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	1	
		1	2	3	4	5	6	7	8	9	0
* TOTALS											
Seminal Vesicle		+	+	+	+	+	+	+	+	+	10
Testes		+	+	+	+	+	+	+	+	+	10
HEMATOPOIETIC SYSTEM											
Bone Marrow		+	+	+	+	+	+	+	+	+	10
Lymph Node, Bronchial		M	+	+	+	+	+	+	+	+	9
Lymph Node, Mandibular		+	+	+	M	+	+	M	+	I	7
Lymph Node, Mediastinal		M	M	+	+	M	+	+	M	+	6
Lymph Node, Mesenteric		+	+	+	+	+	+	+	+	+	10
Spleen		+	+	+	+	+	+	+	+	+	10
Thymus		+	+	+	+	+	+	+	+	+	10
INTEGUMENTARY SYSTEM											
Mammary Gland		M	M	M	M	M	M	M	M	M	0
Skin		+	+	+	+	+	+	+	+	+	10
MUSCULOSKELETAL SYSTEM											
Bone		+	+	+	+	+	+	+	+	+	10
NERVOUS SYSTEM											

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		9	9	9	9	9	9	9	9	9	
		5	5	5	5	5	5	5	5	5	
		0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	1	
		1	2	3	4	5	6	7	8	9	0
		* TOTALS									
Brain		+	+	+	+	+	+	+	+	+	10
RESPIRATORY SYSTEM											
Larynx		+	+	+	+	+	+	+	+	+	10
Inflammation, Chronic Active							1				1 1.0
Lung		+	+	+	+	+	+	+	+	+	10
Bronchus, Inflammation, Chronic							1				1 1.0
Nose		+	+	+	+	+	+	+	+	+	10
Trachea		+	+	+	+	+	+	+	+	+	10
SPECIAL SENSES SYSTEM											
Eye		+	+	+	+	+	+	+	+	+	10
Harderian Gland		+	+	+	+	+	+	+	+	+	10
URINARY SYSTEM											
Kidney		+	+	+	+	+	+	+	+	+	10
Renal Tubule, Regeneration						1					1 1.0
Urinary Bladder		+	+	+	+	+	+	+	+	+	10

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		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		5	5	5	5	5	5	5	5	5	
6.25 ppm	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		2	2	2	2	2	2	2	2	2	
		0	0	0	0	0	0	0	0	0	1
		1	2	3	4	5	6	7	8	9	0
										* TOTALS	

ALIMENTARY SYSTEM

NONE

CARDIOVASCULAR SYSTEM

NONE

ENDOCRINE SYSTEM

NONE

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

NONE

HEMATOPOIETIC SYSTEM

NONE

INTEGUMENTARY SYSTEM

NONE

MUSCULOSKELETAL SYSTEM

NONE

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		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		5	5	5	5	5	5	5	5	5	
		5	5	5	5	5	5	5	5	5	
6.25 ppm	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		2	2	2	2	2	2	2	2	2	
		0	0	0	0	0	0	0	0	0	1
		1	2	3	4	5	6	7	8	9	0
* TOTALS											

NERVOUS SYSTEM

NONE

RESPIRATORY SYSTEM

Larynx	+	+	+	+	+	+	+	+	+	+	10
Inflammation, Chronic Active	1										1 1.0
Lung	+	+	+	+	+	+	+	+	+	+	10
Nose	+	+	+	+	+	+	+	+	+	+	10
Inflammation, Chronic									1		1 1.0
Trachea	+	+	+	+	+	+	+	+	+	+	10

SPECIAL SENSES SYSTEM

NONE

URINARY SYSTEM

NONE

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B6C3F1 MICE MALE	DAY ON TEST	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		5	5	5	5	5	5	5	5	5	
		5	5	5	5	5	5	5	5	5	
12.5 ppm	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		4	4	4	4	4	4	4	4	4	
		0	0	0	0	0	0	0	0	0	1
		1	2	3	4	5	6	7	8	9	0
* TOTALS											

ALIMENTARY SYSTEM

NONE

CARDIOVASCULAR SYSTEM

NONE

ENDOCRINE SYSTEM

NONE

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

NONE

HEMATOPOIETIC SYSTEM

NONE

INTEGUMENTARY SYSTEM

NONE

MUSCULOSKELETAL SYSTEM

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B6C3F1 MICE MALE	DAY ON TEST	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		5	5	5	5	5	5	5	5	5	
		5	5	5	5	5	5	5	5	5	
12.5 ppm	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		4	4	4	4	4	4	4	4	4	
		0	0	0	0	0	0	0	0	0	1
		1	2	3	4	5	6	7	8	9	0
* TOTALS											

NERVOUS SYSTEM

NONE

RESPIRATORY SYSTEM

Larynx	+	+	+	+	+	+	+	+	+	+	10
Inflammation, Chronic Active					1			1	1		3 1.0
Epithelium, Necrosis								1	1		2 1.0
Lung	+	+	+	+	+	+	+	+	+	+	10
Nose	+	+	+	+	+	+	+	+	+	+	10
Trachea	+	+	+	+	+	+	+	+	+	+	10

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NONE

URINARY SYSTEM

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B6C3F1 MICE MALE	DAY ON TEST	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		5	5	5	5	5	5	5	5	5	
25 ppm	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		6	6	6	6	6	6	6	6	6	
		0	0	0	0	0	0	0	0	0	1
		1	2	3	4	5	6	7	8	9	0
* TOTALS											

ALIMENTARY SYSTEM

NONE

CARDIOVASCULAR SYSTEM

NONE

ENDOCRINE SYSTEM

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GENERAL BODY SYSTEM

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GENITAL SYSTEM

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INTEGUMENTARY SYSTEM

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		9	9	9	9	9	9	9	9	9	9	9	9	9	9
25 ppm	ANIMAL ID	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		6	6	6	6	6	6	6	6	6	6	6	6	6	6
		0	0	0	0	0	0	0	0	0	0	0	0	1	0
		1	2	3	4	5	6	7	8	9	0				
* TOTALS															

NERVOUS SYSTEM

NONE

RESPIRATORY SYSTEM

Larynx	+	+	+	+	+	+	+	+	+	+	10		
Inflammation, Chronic Active							2		1	2		3 1.7	
Epithelium, Necrosis									1			1 1.0	
Respiratory Epithelium, Hyperplasia							1			1		2 1.0	
Respiratory Epithelium, Metaplasia, Squamous							1					1 1.0	
Squamous Epithelium, Hyperplasia	1						1			1		3 1.0	
Lung	+	+	+	+	+	+	+	+	+	+	10		
Nose	+	+	+	+	+	+	+	+	+	+	10		
Respiratory Epithelium, Degeneration										1		1 1.0	
Respiratory Epithelium, Metaplasia, Squamous						1						1 1.0	
Respiratory Epithelium, Necrosis	1	1	1		1	1	1	1	1			8 1.0	
Trachea	+	+	+	+	+	+	+	+	+	+	10		
Epithelium, Degeneration	1											1 1.0	

SPECIAL SENSES SYSTEM

NONE

URINARY SYSTEM

NONE

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		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		5	5	5	5	5	5	5	5	5	
50 ppm	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		8	8	8	8	8	8	8	8	8	
		0	0	0	0	0	0	0	0	0	1
		1	2	3	4	5	6	7	8	9	0
* TOTALS											

ALIMENTARY SYSTEM

NONE

CARDIOVASCULAR SYSTEM

NONE

ENDOCRINE SYSTEM

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		0	0	0	0	0	0	0	0	0	0	0	0	0
50 ppm	ANIMAL ID	9	9	9	9	9	9	9	9	9	9	9	9	9
		5	5	5	5	5	5	5	5	5	5	5	5	5
		0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0
		8	8	8	8	8	8	8	8	8	8	8	8	8
		0	0	0	0	0	0	0	0	0	0	0	1	0
		1	2	3	4	5	6	7	8	9	0			
* TOTALS														

NERVOUS SYSTEM

NONE

RESPIRATORY SYSTEM

Larynx	+	+	+	+	+	+	+	+	+	+	10		
Inflammation, Chronic Active	1		1	1	1	2		1	1	1		8	1.1
Epithelium, Necrosis	1	1	1	1		1	1	1	1	1		9	1.0
Respiratory Epithelium, Hyperplasia	1		2	2		2	1	2	1	1		8	1.5
Respiratory Epithelium, Metaplasia, Atypical Squamous	2	1	1		1	1	2		1			7	1.3
Respiratory Epithelium, Metaplasia, Squamous				2				1		1		3	1.3
Respiratory Epithelium, Regeneration		2			1	1			1	1		5	1.2
Squamous Epithelium, Hyperplasia	2	1								1		3	1.3
Squamous Epithelium, Hyperplasia, Atypical			1	2	2	2	2	2	1			7	1.7
Lung	+	+	+	+	+	+	+	+	+	+	10		
Bronchus, Inflammation, Chronic			1	1	1	2	1	1	1	2		7	1.3
Bronchus, Epithelium, Hyperplasia, Atypical	1			2								2	1.5
Bronchus, Epithelium, Regeneration									1			1	1.0
Nose	+	+	+	+	+	+	+	+	+	+	10		
Inflammation, Suppurative	2	2	2	2	2	2	2	2	1	2		10	1.9
Olfactory Epithelium, Atrophy	1	1	3	2	1	2	2	2	2	2		10	1.8
Olfactory Epithelium, Metaplasia, Respiratory		1		2		2	1	2	1			6	1.5
Respiratory Epithelium, Metaplasia, Squamous	2	2	2	2	2	2	2	2	2	2		10	2.0
Respiratory Epithelium, Necrosis	2	2	2	2	2	2	2	2	2	2		10	2.0
Respiratory Epithelium, Regeneration	1	1	1	1	1	1	1	1	1	1		10	1.0
Turbinate, Atrophy	3	3	3	3	3	3	3	3	3	3		10	3.0

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20725 - 02
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/29/2016
 Time Report Requested: 14:39:21
 First Dose M/F: 07/28/08 / 07/28/08
 Lab: BNW

B6C3F1 MICE MALE 100 ppm	DAY ON TEST	0	0	0	0	0	0	0	0	0	0	ANIMAL ID			
		0	0	0	0	0	0	0	0	0	0				
		9	9	9	9	9	9	9	9	9	9				
		5	5	5	5	5	5	5	5	5	5				
		0	0	0	0	0	0	0	0	0	0				
		1	1	1	1	1	1	1	1	1	1				
		0	0	0	0	0	0	0	0	0	0				
		0	0	0	0	0	0	0	0	0	1				
		1	2	3	4	5	6	7	8	9	0				* TOTALS

ALIMENTARY SYSTEM

Esophagus	+	+	+	+	+	+	+	+	+	+				10
Gallbladder	M	+	+	+	+	+	M	+	+	+				8
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	+				10
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	+				10
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	+				10
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	+				10
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+				10
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	+				10
Liver	+	+	+	+	+	+	+	+	+	+				10
Inflammation, Chronic Active	1	1		1		1								4 1.0
Pancreas	+	+	+	+	+	+	+	+	+	+				10
Salivary Glands	+	+	+	+	+	+	+	+	+	+				10
Stomach, Forestomach	+	+	+	+	+	+	+	+	+	+				10
Stomach, Glandular	+	+	+	+	+	+	+	+	+	+				10

CARDIOVASCULAR SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

2,3-Butanedione

CAS Number: 431-03-8

Date Report Requested: 04/29/2016

Time Report Requested: 14:39:21

First Dose M/F: 07/28/08 / 07/28/08

Lab: BNW

B6C3F1 MICE MALE 100 ppm	DAY ON TEST	0	0	0	0	0	0	0	0	0	
	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		5	5	5	5	5	5	5	5	5	
		1	1	1	1	1	1	1	1	1	
		0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	1	
		1	2	3	4	5	6	7	8	9	
											* TOTALS
Blood Vessel		+	+	+	+	+	+	+	+	+	10
Heart		+	+	+	+	+	+	+	+	+	10
ENDOCRINE SYSTEM											
Adrenal Cortex		+	+	+	+	+	+	+	+	+	10
Adrenal Medulla		+	+	+	+	+	+	+	+	+	10
Islets, Pancreatic		+	+	+	+	+	+	+	+	+	10
Parathyroid Gland		+	+	M	M	+	+	+	+	M	7
Pituitary Gland		+	+	+	+	+	+	M	+	+	9
Thyroid Gland		+	+	+	+	+	+	+	+	+	10
GENERAL BODY SYSTEM											
NONE											
GENITAL SYSTEM											
Epididymis		+	+	+	+	+	+	+	+	+	10
Preputial Gland		+	+	+	+	+	+	+	+	+	10
Inflammation, Chronic Active									4		1 4.0
Prostate		+	+	+	+	+	+	+	+	+	10

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

2,3-Butanedione

CAS Number: 431-03-8

Date Report Requested: 04/29/2016

Time Report Requested: 14:39:21

First Dose M/F: 07/28/08 / 07/28/08

Lab: BNW

B6C3F1 MICE MALE 100 ppm	DAY ON TEST	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		5	5	5	5	5	5	5	5	5	
	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		1	1	1	1	1	1	1	1	1	
		0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	1	
		1	2	3	4	5	6	7	8	9	
											* TOTALS

Seminal Vesicle + + + + + + + + + + **10**

Testes + + + + + + + + + + **10**

HEMATOPOIETIC SYSTEM

Bone Marrow + + + + + + + + + + **10**

Lymph Node, Bronchial + + + + + M + + + + **9**

Lymph Node, Mandibular + + M + + + M M + + **7**

Lymph Node, Mediastinal M M + M M M + M M + **3**

Lymph Node, Mesenteric + + + + + + + + + + **10**

Spleen + + + + + + + + + + **10**

Thymus + + + + + + + + + + **10**

INTEGUMENTARY SYSTEM

Mammary Gland M M M M M M M M M M **0**

Skin + + + + + + + + + + **10**

MUSCULOSKELETAL SYSTEM

Bone + + + + + + + + + + **10**

NERVOUS SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20725 - 02
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/29/2016
 Time Report Requested: 14:39:21
 First Dose M/F: 07/28/08 / 07/28/08
 Lab: BNW

B6C3F1 MICE MALE	DAY ON TEST										ANIMAL ID
	0	0	0	0	0	0	0	0	0	0	
100 ppm	0	0	0	0	0	0	0	0	0	0	0
	9	9	9	9	9	9	9	9	9	9	1
	5	5	5	5	5	5	5	5	5	5	0
	0	0	0	0	0	0	0	0	0	0	0
	1	1	1	1	1	1	1	1	1	1	0
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	1	0
	1	2	3	4	5	6	7	8	9	0	
											* TOTALS

Brain + + + + + + + + + + **10**

RESPIRATORY SYSTEM

Larynx	+ + + + + + + + + +										10	
Inflammation, Chronic Active	1	1	2	1	1	2	1	1	1	1	10	1.2
Epithelium, Necrosis	1		1	1	1	1	1	1		1	8	1.0
Respiratory Epithelium, Hyperplasia			3		2	2	3	2	2	3	8	2.4
Respiratory Epithelium, Hyperplasia, Atypical				2							1	2.0
Respiratory Epithelium, Metaplasia, Atypical Squamous	4	4	4	4	4	3	3	3	2	3	10	3.4
Squamous Epithelium, Hyperplasia						2	3	3	2	3	5	2.6
Squamous Epithelium, Hyperplasia, Atypical	3	3	2	3	3						5	2.8
Lung	+ + + + + + + + + +										10	
Bronchus, Infiltration Cellular, Polymorphonuclear	3	2	1	1	2	1	2	1	2	2	10	1.7
Bronchus, Inflammation, Chronic	2	3	2	3	3	3	3	2	3	3	10	2.7
Bronchus, Epithelium, Degeneration								1			1	1.0
Bronchus, Epithelium, Hyperplasia								1			1	1.0
Bronchus, Epithelium, Hyperplasia, Atypical	2	2	2	1	2	3	2		2	3	9	2.1
Bronchus, Epithelium, Metaplasia, Atypical Squamous	2	2	3	2	2	3	2	2	2	2	10	2.2
Bronchus, Epithelium, Regeneration	2	3	3	3	3	2	3		3	1	9	2.6
Nose	+ + + + + + + + + +										10	
Inflammation, Suppurative	3	3	3	3	3	3	3	3	3	3	10	3.0
Olfactory Epithelium, Atrophy	2	2	1	1	1	2	2	1	2	2	10	1.6
Olfactory Epithelium, Metaplasia, Respiratory	1	2	2	1			2	1	2		7	1.6
Respiratory Epithelium, Metaplasia, Squamous	3	3	3	3	3	3	3	3	3	3	10	3.0
Respiratory Epithelium, Necrosis	1	2	2	1	2	1	2	2	2	2	10	1.7

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically M .. Missing tissue
 X .. Lesion present A .. Autolysis precludes evaluation
 I .. Insufficient tissue BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/29/2016
 Time Report Requested: 14:39:21
 First Dose M/F: 07/28/08 / 07/28/08
 Lab: BNW

B6C3F1 MICE MALE 100 ppm	DAY ON TEST										* TOTALS	
	0 0 9 5	0 0 9 5	0 0 9 5	0 0 9 5	0 0 9 5	0 0 9 5	0 0 9 5	0 0 9 5	0 0 9 5	0 0 9 5		
	ANIMAL ID											
	0 1 0 0 1	0 1 0 0 2	0 1 0 0 3	0 1 0 0 4	0 1 0 0 5	0 1 0 0 6	0 1 0 0 7	0 1 0 0 8	0 1 0 0 9	0 1 0 0 0		
Respiratory Epithelium, Regeneration	1	1	1	1	1	1	1	1	1	1	10	1.0
Septum, Perforation		3					2				2	2.5
Turbinate, Atrophy	3	3	3	3	3	3	3	3	3	3	10	3.0
Turbinate, Necrosis	1				1	1			1	1	5	1.0
Trachea											10	
Inflammation, Chronic Active	1	1	1			1	1		1	2	7	1.1
Epithelium, Degeneration		2		2	2	2	2	2	2	2	8	2.0
Epithelium, Hyperplasia		3	3	2	2	2	3	2	2	3	9	2.4
Epithelium, Metaplasia, Atypical Squamous	3	3	3	2	3	3	3	3	2	3	10	2.8
SPECIAL SENSES SYSTEM												
Eye	+	+	+	+	+	+	+	+	+	+	10	
Harderian Gland	+	+	+	+	+	+	+	+	+	+	10	
URINARY SYSTEM												
Kidney	+	+	+	+	+	+	+	+	+	+	10	
Urinary Bladder	+	+	+	+	+	+	+	+	+	+	10	

*** END OF MALE DATA ***

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/29/2016
 Time Report Requested: 14:39:21
 First Dose M/F: 07/28/08 / 07/28/08
 Lab: BNW

B6C3F1 MICE FEMALE CONTROL	DAY ON TEST										* TOTALS
	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	
ANIMAL ID	0	0	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	0	0	
	1	1	1	1	1	1	1	1	1	1	
	0	0	0	0	0	0	0	0	0	1	
	1	2	3	4	5	6	7	8	9	0	
Blood Vessel	+	+	+	+	+	+	+	+	+	+	10
Heart	+	+	+	+	+	+	+	+	+	+	10
ENDOCRINE SYSTEM											
Adrenal Cortex	+	+	+	+	+	+	+	+	+	+	10
Adrenal Medulla	+	+	+	+	+	+	+	+	+	+	10
Islets, Pancreatic	+	+	+	+	+	+	+	+	+	+	10
Parathyroid Gland	M	+	M	M	M	+	M	+	+	+	5
Pituitary Gland	+	+	+	+	+	+	+	+	+	+	10
Thyroid Gland	+	+	+	+	+	+	+	+	+	+	10
GENERAL BODY SYSTEM											
NONE											
GENITAL SYSTEM											
Clitoral Gland	+	+	+	+	+	+	+	+	+	+	10
Ovary	+	+	+	+	+	+	+	+	+	+	10
Uterus	+	+	+	+	+	+	+	+	+	+	10
HEMATOPOIETIC SYSTEM											

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/29/2016
 Time Report Requested: 14:39:21
 First Dose M/F: 07/28/08 / 07/28/08
 Lab: BNW

B6C3F1 MICE FEMALE CONTROL	DAY ON TEST	0	0	0	0	0	0	0	0	0	0	* TOTALS
	ANIMAL ID	0	0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	9	
		6	6	6	6	6	6	6	6	6	6	
		1	1	1	1	1	1	1	1	1	1	
		0	0	0	0	0	0	0	0	0	1	
		1	2	3	4	5	6	7	8	9	0	
Bone Marrow		+	+	+	+	+	+	+	+	+	+	10
Lymph Node, Bronchial		+	+	M	+	+	+	+	+	+	+	9
Lymph Node, Mandibular		M	+	+	+	+	+	+	+	+	+	9
Lymph Node, Mediastinal		M	M	+	M	M	+	M	+	M	M	3
Lymph Node, Mesenteric		+	+	+	+	+	+	+	+	+	+	10
Spleen		+	+	+	+	+	+	+	+	+	+	10
Thymus		+	+	+	+	+	+	+	+	+	+	10
INTEGUMENTARY SYSTEM												
Mammary Gland		+	+	+	+	+	+	+	+	+	+	10
Skin		+	+	+	+	+	+	+	+	+	+	10
MUSCULOSKELETAL SYSTEM												
Bone		+	+	+	+	+	+	+	+	+	+	10
NERVOUS SYSTEM												
Brain		+	+	+	+	+	+	+	+	+	+	10
RESPIRATORY SYSTEM												
Larynx		+	+	+	+	+	+	+	+	+	+	10

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/29/2016
 Time Report Requested: 14:39:21
 First Dose M/F: 07/28/08 / 07/28/08
 Lab: BNW

B6C3F1 MICE FEMALE	DAY ON TEST	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		6	6	6	6	6	6	6	6	6	
6.25 ppm	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		3	3	3	3	3	3	3	3	3	
		0	0	0	0	0	0	0	0	0	1
		1	2	3	4	5	6	7	8	9	0
* TOTALS											

ALIMENTARY SYSTEM

NONE

CARDIOVASCULAR SYSTEM

NONE

ENDOCRINE SYSTEM

NONE

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

NONE

HEMATOPOIETIC SYSTEM

NONE

INTEGUMENTARY SYSTEM

NONE

MUSCULOSKELETAL SYSTEM

NONE

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/29/2016
 Time Report Requested: 14:39:21
 First Dose M/F: 07/28/08 / 07/28/08
 Lab: BNW

B6C3F1 MICE FEMALE	DAY ON TEST	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		6	6	6	6	6	6	6	6	6	
6.25 ppm	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		3	3	3	3	3	3	3	3	3	
		0	0	0	0	0	0	0	0	0	1
		1	2	3	4	5	6	7	8	9	0
* TOTALS											

NERVOUS SYSTEM

NONE

RESPIRATORY SYSTEM

Larynx	+	+	+	+	+	+	+	+	+	+	10
Inflammation, Chronic Active	1		1		1						3 1.0
Lung	+	+	+	+	+	+	+	+	+	+	10
Nose	+	+	+	+	+	+	+	+	+	+	10
Trachea	+	+	+	+	+	+	+	+	+	+	10

SPECIAL SENSES SYSTEM

NONE

URINARY SYSTEM

NONE

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/29/2016
 Time Report Requested: 14:39:21
 First Dose M/F: 07/28/08 / 07/28/08
 Lab: BNW

B6C3F1 MICE FEMALE	DAY ON TEST	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
12.5 ppm	ANIMAL ID	6	6	6	6	6	6	6	6	6	
		0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		5	5	5	5	5	5	5	5		
		0	0	0	0	0	0	0	0	1	
		1	2	3	4	5	6	7	8	9	0
* TOTALS											

ALIMENTARY SYSTEM

NONE

CARDIOVASCULAR SYSTEM

NONE

ENDOCRINE SYSTEM

NONE

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

NONE

HEMATOPOIETIC SYSTEM

NONE

INTEGUMENTARY SYSTEM

NONE

MUSCULOSKELETAL SYSTEM

NONE

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/29/2016
 Time Report Requested: 14:39:21
 First Dose M/F: 07/28/08 / 07/28/08
 Lab: BNW

B6C3F1 MICE FEMALE	DAY ON TEST	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		6	6	6	6	6	6	6	6	6	
12.5 ppm	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		5	5	5	5	5	5	5	5	5	
		0	0	0	0	0	0	0	0	0	1
		1	2	3	4	5	6	7	8	9	0
* TOTALS											

NERVOUS SYSTEM

NONE

RESPIRATORY SYSTEM

Larynx	+	+	+	+	+	+	+	+	+	+	10
Inflammation, Chronic Active						1					1 1.0
Lung	+	+	+	+	+	+	+	+	+	+	10
Nose	+	+	+	+	+	+	+	+	+	+	10
Trachea	+	+	+	+	+	+	+	+	+	+	10

SPECIAL SENSES SYSTEM

NONE

URINARY SYSTEM

NONE

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/29/2016
 Time Report Requested: 14:39:21
 First Dose M/F: 07/28/08 / 07/28/08
 Lab: BNW

B6C3F1 MICE FEMALE	DAY ON TEST										* TOTALS
	0096	0096	0096	0096	0096	0096	0096	0096	0096	0096	
25 ppm	00701	00702	00703	00704	00705	00706	00707	00708	00709	00710	

NONE

NERVOUS SYSTEM

NONE

RESPIRATORY SYSTEM

Larynx	+	+	+	+	+	+	+	+	+	+	10	
Inflammation, Chronic Active				1			1		1	1		4 1.0
Epithelium, Necrosis										1		1 1.0
Respiratory Epithelium, Hyperplasia			1	1					1	1		4 1.0
Respiratory Epithelium, Metaplasia, Squamous										1		1 1.0
Respiratory Epithelium, Regeneration			1							1		2 1.0
Squamous Epithelium, Hyperplasia							1			1		2 1.0
Squamous Epithelium, Hyperplasia, Atypical			1	1								2 1.0
Lung	+	+	+	+	+	+	+	+	+	+	10	
Metaplasia, Osseous			1									1 1.0
Nose	+	+	+	+	+	+	+	+	+	+	10	
Inflammation, Suppurative	1											1 1.0
Olfactory Epithelium, Necrosis							1					1 1.0
Respiratory Epithelium, Degeneration						1			1			2 1.0
Respiratory Epithelium, Necrosis	1			1				1		1		4 1.0
Trachea	+	+	+	+	+	+	+	+	+	+	10	

SPECIAL SENSES SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/29/2016
 Time Report Requested: 14:39:21
 First Dose M/F: 07/28/08 / 07/28/08
 Lab: BNW

B6C3F1 MICE FEMALE 25 ppm	DAY ON TEST	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		6	6	6	6	6	6	6	6	6	
	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		7	7	7	7	7	7	7	7	7	
		0	0	0	0	0	0	0	0	1	
		1	2	3	4	5	6	7	8	9	
											* TOTALS

NONE

URINARY SYSTEM

NONE

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/29/2016
 Time Report Requested: 14:39:21
 First Dose M/F: 07/28/08 / 07/28/08
 Lab: BNW

B6C3F1 MICE FEMALE	DAY ON TEST	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		6	6	6	6	6	6	6	6	6	
50 ppm	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		0	0	0	0	0	0	0	0	0	1
		1	2	3	4	5	6	7	8	9	0
										* TOTALS	

ALIMENTARY SYSTEM

NONE

CARDIOVASCULAR SYSTEM

NONE

ENDOCRINE SYSTEM

NONE

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

NONE

HEMATOPOIETIC SYSTEM

NONE

INTEGUMENTARY SYSTEM

NONE

MUSCULOSKELETAL SYSTEM

NONE

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

2,3-Butanedione

CAS Number: 431-03-8

Date Report Requested: 04/29/2016

Time Report Requested: 14:39:21

First Dose M/F: 07/28/08 / 07/28/08

Lab: BNW

B6C3F1 MICE FEMALE	50 ppm	DAY ON TEST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		ANIMAL ID	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
			1	2	3	4	5	6	7	8	9	0									
																					* TOTALS

NERVOUS SYSTEM

NONE

RESPIRATORY SYSTEM

Larynx	+	+	M	+	+	+	+	+	+	+										9			
Inflammation, Chronic Active	1			1					1		1											4	1.0
Epithelium, Necrosis	1	1			1						1		1									5	1.0
Respiratory Epithelium, Hyperplasia		1		1	1	1	1	2	1	1												8	1.1
Respiratory Epithelium, Metaplasia, Squamous	1	2		1	1	2	1	2	2	2	2	2										9	1.6
Respiratory Epithelium, Regeneration	1	2		2		2	2	2	2	1	1											8	1.6
Squamous Epithelium, Hyperplasia	2				1	2	2															4	1.8
Squamous Epithelium, Hyperplasia, Atypical									1	2	1											3	1.3
Lung	+	+	+	+	+	+	+	+	+	+												10	
Bronchus, Inflammation, Chronic	2				2	1	2				1											5	1.6
Bronchus, Epithelium, Regeneration	1				1	1			1	1	1											6	1.0
Nose	+	+	+	+	+	+	+	+	+	+												10	
Inflammation, Suppurative	2	2	2	2	3	2	2	2	2	2												10	2.1
Olfactory Epithelium, Accumulation, Hyaline Droplet																						1	1.0
Olfactory Epithelium, Atrophy	2	2	2	2	2	2	2	2	2	2	2											10	2.0
Olfactory Epithelium, Metaplasia, Respiratory	2	2		1	1	2	2	2	2	1												8	1.6
Respiratory Epithelium, Metaplasia, Squamous	2	2	2	2	2	2	2	2	2	2	2											10	2.0
Respiratory Epithelium, Necrosis	1	1	1	1	2	2	2	2	2	2	2											10	1.6
Respiratory Epithelium, Regeneration	1	1	2	1	1	1			1	1	1											9	1.1
Turbinate, Atrophy	3	3	3	3	3	3	3	3	3	3	3											10	3.0
Turbinate, Necrosis				1		1			1		1											4	1.0

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20725 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

2,3-Butanedione

CAS Number: 431-03-8

Date Report Requested: 04/29/2016

Time Report Requested: 14:39:21

First Dose M/F: 07/28/08 / 07/28/08

Lab: BNW

B6C3F1 MICE FEMALE	50 ppm	DAY ON TEST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		ANIMAL ID	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			1	2	3	4	5	6	7	8	9	0									

* TOTALS

Trachea	+	+	+	+	+	+	+	+	+	+	+									10
Epithelium, Degeneration								1				2	2							3 1.7
Epithelium, Hyperplasia												1	1							2 1.0
Epithelium, Regeneration	2	2	2	2	3	2			2											7 2.1

SPECIAL SENSES SYSTEM

NONE

URINARY SYSTEM

NONE

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
+ .. Tissue examined microscopically M .. Missing tissue
X .. Lesion present A .. Autolysis precludes evaluation
I .. Insufficient tissue BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
1) Minimal 3) Moderate
2) Mild 4) Marked

Experiment Number: 20725 - 02
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/29/2016
 Time Report Requested: 14:39:21
 First Dose M/F: 07/28/08 / 07/28/08
 Lab: BNW

B6C3F1 MICE FEMALE 100 ppm	DAY ON TEST	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		6	6	6	6	6	6	6	6	6	
	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		1	1	1	1	1	1	1	1	1	
		1	1	1	1	1	1	1	1	1	
		0	0	0	0	0	0	0	0	1	
		1	2	3	4	5	6	7	8	9	
											* TOTALS

ALIMENTARY SYSTEM

Esophagus	+	+	+	+	+	+	+	+	+	10
Gallbladder	+	+	+	+	+	M	M	M	M	6
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	10
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	10
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	10
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	10
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	10
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	10
Liver	+	+	+	+	+	+	+	+	+	10
Inflammation, Chronic Active	1	1		1	1	1		1	1	8 1.0
Pancreas	+	+	+	+	+	+	+	+	+	10
Salivary Glands	+	+	+	+	+	+	+	+	+	10
Stomach, Forestomach	+	+	+	+	+	+	+	+	+	10
Stomach, Glandular	+	+	+	+	+	+	+	+	+	10

CARDIOVASCULAR SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

2,3-Butanedione

CAS Number: 431-03-8

Date Report Requested: 04/29/2016

Time Report Requested: 14:39:21

First Dose M/F: 07/28/08 / 07/28/08

Lab: BNW

B6C3F1 MICE FEMALE 100 ppm	DAY ON TEST										* TOTALS
	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	
ANIMAL ID	0	0	0	0	0	0	0	0	0	0	
	1	1	1	1	1	1	1	1	1	1	
	1	1	1	1	1	1	1	1	1	1	
	0	0	0	0	0	0	0	0	0	0	1
	1	2	3	4	5	6	7	8	9	0	
Blood Vessel	+	+	+	+	+	+	+	+	+	+	10
Heart	+	+	+	+	+	+	+	+	+	+	10
ENDOCRINE SYSTEM											
Adrenal Cortex	+	+	+	+	+	+	+	+	+	+	10
Adrenal Medulla	+	+	+	+	+	+	+	+	+	+	10
Islets, Pancreatic	+	+	+	+	+	+	+	+	+	+	10
Parathyroid Gland	M	+	+	+	M	+	+	+	+	M	7
Pituitary Gland	+	+	+	+	+	+	+	+	+	+	10
Thyroid Gland	+	+	+	+	+	+	+	M	M	+	8
GENERAL BODY SYSTEM											
NONE											
GENITAL SYSTEM											
Clitoral Gland	+	M	+	+	M	+	+	M	M	+	6
Inflammation, Chronic Active				1			1				2 1.0
Ovary	+	+	+	+	+	+	+	+	+	+	10
Uterus	+	+	+	+	+	+	+	+	+	+	10

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/29/2016
 Time Report Requested: 14:39:21
 First Dose M/F: 07/28/08 / 07/28/08
 Lab: BNW

B6C3F1 MICE FEMALE 100 ppm	DAY ON TEST	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	
		9	9	9	9	9	9	9	9	9	
		6	6	6	6	6	6	6	6	6	
	ANIMAL ID	0	0	0	0	0	0	0	0	0	
		1	1	1	1	1	1	1	1	1	
		1	1	1	1	1	1	1	1	1	
		0	0	0	0	0	0	0	0	1	
		1	2	3	4	5	6	7	8	9	

*** TOTALS**

HEMATOPOIETIC SYSTEM

Bone Marrow	+	+	+	+	+	+	+	+	+	+	10
Lymph Node, Bronchial	M	+	+	+	+	+	+	+	+	+	9
Lymph Node, Mandibular	+	+	+	M	+	+	+	+	+	+	9
Lymph Node, Mediastinal	M	M	M	M	M	M	M	M	+	M	1
Lymph Node, Mesenteric	+	+	+	+	+	+	+	+	+	+	10
Spleen	+	+	+	+	+	+	+	+	+	+	10
Thymus	+	+	+	+	+	+	+	+	+	+	10

INTEGUMENTARY SYSTEM

Mammary Gland	+	+	+	+	+	+	+	+	+	+	10
Skin	+	+	+	+	+	+	+	+	+	+	10

MUSCULOSKELETAL SYSTEM

Bone	+	+	+	+	+	+	+	+	+	+	10
------	---	---	---	---	---	---	---	---	---	---	-----------

NERVOUS SYSTEM

Brain	+	+	+	+	+	+	+	+	+	+	10
-------	---	---	---	---	---	---	---	---	---	---	-----------

RESPIRATORY SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 20725 - 02

Test Type: 90-DAY

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

2,3-Butanedione

CAS Number: 431-03-8

Date Report Requested: 04/29/2016

Time Report Requested: 14:39:21

First Dose M/F: 07/28/08 / 07/28/08

Lab: BNW

B6C3F1 MICE FEMALE 100 ppm	DAY ON TEST										* TOTALS
	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	
ANIMAL ID	0	0	0	0	0	0	0	0	0	0	
	1	1	1	1	1	1	1	1	1	1	
	1	1	1	1	1	1	1	1	1	1	
	0	0	0	0	0	0	0	0	0	0	1
	1	2	3	4	5	6	7	8	9	0	
Larynx	+	+	+	+	+	+	+	+	+	+	10
Inflammation, Chronic Active	2	2	2	1	2	1	1	1	2	2	10 1.6
Epithelium, Necrosis	2	1	1		1	1	1	1	1	2	9 1.2
Respiratory Epithelium, Hyperplasia		2	3	2	3	2	3	2	2	2	9 2.3
Respiratory Epithelium, Metaplasia, Atypical Squamous	3	3	4	3	4	4	3	3	3	4	10 3.4
Squamous Epithelium, Hyperplasia							2				1 2.0
Squamous Epithelium, Hyperplasia, Atypical	3	3	3	3	3	2		3	3	3	9 2.9
Lung	+	+	+	+	+	+	+	+	+	+	10
Bronchus, Infiltration Cellular, Polymorphonuclear	2	1	2	2		2		2	1	1	8 1.6
Bronchus, Inflammation, Chronic	2	3	3	3		2		2	2	2	8 2.4
Bronchus, Epithelium, Hyperplasia, Atypical	2	2	3	2		3		2		2	7 2.3
Bronchus, Epithelium, Metaplasia, Atypical Squamous	2	1	2	3		2		2		2	7 2.0
Bronchus, Epithelium, Regeneration	2	3	3	3		1		3	1		7 2.3
Nose	+	+	+	+	+	+	+	+	+	+	10
Inflammation, Suppurative	3	3	3	3	3	3	3	3	3	3	10 3.0
Olfactory Epithelium, Accumulation, Hyaline Droplet								1			1 1.0
Olfactory Epithelium, Atrophy	2	2	2	2	2	2	2	2	2	2	10 2.0
Olfactory Epithelium, Metaplasia, Respiratory	2	1	1	1		2	2	2	2	2	9 1.7
Respiratory Epithelium, Accumulation, Hyaline Droplet							1	1			2 1.0
Respiratory Epithelium, Metaplasia, Squamous	3	3	3	3	3	3	3	3	3	3	10 3.0
Respiratory Epithelium, Necrosis	2	2	2	2	2	2	2	2	2	2	10 2.0
Respiratory Epithelium, Regeneration	2	1	2	1	2	2	2	2	1	1	10 1.6
Septum, Necrosis			1								1 1.0
Turbinate, Atrophy	3	3	3	3	3	3	3	3	3	3	10 3.0

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

Experiment Number: 20725 - 02
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: MICE/B6C3F1

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 04/29/2016
 Time Report Requested: 14:39:21
 First Dose M/F: 07/28/08 / 07/28/08
 Lab: BNW

B6C3F1 MICE FEMALE 100 ppm	DAY ON TEST										ANIMAL ID			
	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6	0 9 6				
	0	0	0	0	0	0	0	0	0	0	0			
	1	1	1	1	1	1	1	1	1	1	1			
	1	1	1	1	1	1	1	1	1	1	1			
	0	0	0	0	0	0	0	0	0	1	1			
	1	2	3	4	5	6	7	8	9	0				* TOTALS
Turbinate, Necrosis	1	2		2	1	1		1	1	1				8 1.3
Trachea	+	+	+	+	+	+	+	+	+	+				10
Inflammation, Chronic Active	2	1		1	1		1		1	1				7 1.1
Epithelium, Degeneration			1		2	2	2	2	2	2				8 1.9
Epithelium, Hyperplasia	3	2		2	2	2	3	2	2	2				9 2.2
Epithelium, Metaplasia, Atypical Squamous	4	3	3	3	3	3	4	3	3	3				10 3.2
SPECIAL SENSES SYSTEM														
Eye	+	+	+	+	+	+	+	+	+	+				10
Cornea, Epithelium, Cellular Alteration, Focal										1				1 1.0
Harderian Gland	+	+	+	+	+	+	+	+	+	+				10
URINARY SYSTEM														
Kidney	+	+	+	+	+	+	+	+	+	+				10
Renal Tubule, Casts Protein					1									1 1.0
Urinary Bladder	+	+	+	+	+	+	+	+	+	+				10

*** END OF REPORT ***

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