

Experiment Number: 20725 - 01
Test Type: 90-DAY
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS

2,3-Butanedione
CAS Number: 431-03-8

Date Report Requested: 01/12/2017
Time Report Requested: 15:54:18
First Dose M/F: 07/28/08 / 07/29/08
Lab: BNW

F1_Rev.2_RE

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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SUMMARY OF STATISTICALLY SIGNIFICANT ($P \leq .05$) RESULTS IN THE ANALYSIS OF 2,3-BUTANEDIONE

MALE RATS

Organ

Kidney

Kidney: Pelvis

Larynx

Larynx: Epithelium

Larynx: Respiratory Epithelium

Larynx: Squamous Epithelium

Lung

Lung: Bronchiole, Epithelium

Lung: Bronchus

Lung: Bronchus, Epithelium

Lymph Node, Mandibular

Nose

Nose: Lymphoid Tissue

Nose: Olfactory Epithelium

Nose: Respiratory Epithelium

Nose: Septum

Nose: Turbinate

Morphology

Cyst

Nephropathy

Dilatation

Inflammation Chronic

Necrosis

Hyperplasia

Metaplasia

Hyperplasia

Hyperplasia Atypical

Congestion

Infiltration Cellular Histiocyte

Inflammation Acute

Inflammation Eosinophil

Hyperplasia

Inflammation Chronic

Hyperplasia

Hyperplasia Atypical

Necrosis

Regeneration

Hemorrhage

Inflammation

Hyperplasia

Atrophy

Degeneration

Metaplasia Respiratory

Necrosis

Hyperplasia

Metaplasia

Necrosis

Regeneration

Necrosis

Atrophy

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SUMMARY OF STATISTICALLY SIGNIFICANT (P<=.05) RESULTS IN THE ANALYSIS OF 2,3-BUTANEDIONE

Pancreas
Prostate
Trachea
Trachea: Epithelium

Atrophy
Inflammation Chronic
Inflammation Chronic
Hyperplasia
Metaplasia
Necrosis
Regeneration

FEMALE RATS

Organ

Eye: Cornea
Larynx
Larynx: Epithelium
Larynx: Respiratory Epithelium

Larynx: Squamous Epithelium
Lung

Lung: Bronchiole, Epithelium
Lung: Bronchus, Epithelium

Nose
Nose: Lymphoid Tissue
Nose: Olfactory Epithelium

Nose: Respiratory Epithelium

Morphology

Inflammation Acute
Inflammation Chronic
Necrosis
Hyperplasia
Metaplasia
Regeneration
Hyperplasia
Foreign Body
Infiltration Cellular Histiocyte
Inflammation Acute
Inflammation Eosinophil
Hyperplasia
Hyperplasia
Hyperplasia Atypical
Metaplasia
Necrosis
Regeneration
Inflammation
Hyperplasia
Atrophy
Degeneration
Metaplasia Respiratory
Necrosis
Hyperplasia
Metaplasia

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SUMMARY OF STATISTICALLY SIGNIFICANT ($P \leq .05$) RESULTS IN THE ANALYSIS OF 2,3-BUTANEDIONE

Nose: Septum

Nose: Turbinate

Thymus

Trachea

Trachea: Epithelium

Necrosis

Regeneration

Necrosis

Atrophy

Hemorrhage

Inflammation Chronic

Hyperplasia

Necrosis

Regeneration

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Eye: Cornea						
Inflammation Acute						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)	2/10 (20%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/10.00	2/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	20%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	91
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.227
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.227
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.227
COCH-ARM / FISHERS	P=0.089	(e)	(e)	(e)	(e)	P=0.237
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.066

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 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Eye: Cornea Mineralization						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/10 (10%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	1/10.00	0/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	10%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/10 (10%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	93 (T)	---
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	P=0.500	(e)
POLY 1.5	(e)	(e)	(e)	(e)	P=0.500	(e)
POLY 6	(e)	(e)	(e)	(e)	P=0.500	(e)
COCH-ARM / FISHERS	P=0.733	(e)	(e)	(e)	P=0.500	(e)
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	P=0.158	(e)

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Eye: Cornea						
Neovascularization						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/10.00	1/9.94
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10.1%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	92
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.499
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.499
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.498
COCH-ARM / FISHERS	P=0.267	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.158

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 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Eye: Cornea, Epithelium Vacuolation						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/10.00	0/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

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 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Harderian Gland Inflammation Chronic						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/0.00	0/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

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 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Heart						
Cardiomyopathy						
LESION RATES						
OVERALL (a)	1/10 (10%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/10 (10%)
POLY-3 RATE (b)	1/10.00	0/0.00	0/0.00	0/0.00	0/0.00	1/9.91
POLY-3 PERCENT (g)	10%	0%	0%	0%	0%	10.1%
TERMINAL (d)	1/10 (10%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/8 (13%)
FIRST INCIDENCE	93 (T)	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.758
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.759
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.756
COCH-ARM / FISHERS	P=0.645	(e)	(e)	(e)	(e)	P=0.763N
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.496

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 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Kidney Cyst						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	1/2 (50%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	1/2.00	0/0.00	0/9.91
POLY-3 PERCENT (g)	0%	0%	0%	50%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	1/2 (50%)	0/0 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	93 (T)	---	---
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	P=0.124	(e)	(e)
POLY 1.5	(e)	(e)	(e)	P=0.124	(e)	(e)
POLY 6	(e)	(e)	(e)	P=0.124	(e)	(e)
COCH-ARM / FISHERS	P=0.519N	(e)	(e)	P=0.167	(e)	(e)
MAX-ISO-POLY-3	(e)	(e)	(e)	P=0.013*	(e)	(e)

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Kidney Nephropathy						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	1/2 (50%)	0/0 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	1/2.00	0/0.00	1/9.91
POLY-3 PERCENT (g)	0%	0%	0%	50%	0%	10.1%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	1/2 (50%)	0/0 (0%)	1/8 (13%)
FIRST INCIDENCE	---	---	---	93 (T)	---	93 (T)
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	P=0.124	(e)	P=0.498
POLY 1.5	(e)	(e)	(e)	P=0.124	(e)	P=0.499
POLY 6	(e)	(e)	(e)	P=0.124	(e)	P=0.496
COCH-ARM / FISHERS	P=0.472	(e)	(e)	P=0.167	(e)	P=0.500
MAX-ISO-POLY-3	(e)	(e)	(e)	P=0.013*	(e)	P=0.158

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Kidney: Pelvis Dilatation						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	1/2 (50%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	1/2.00	0/0.00	0/9.91
POLY-3 PERCENT (g)	0%	0%	0%	50%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	1/2 (50%)	0/0 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	93 (T)	---	---
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	P=0.124	(e)	(e)
POLY 1.5	(e)	(e)	(e)	P=0.124	(e)	(e)
POLY 6	(e)	(e)	(e)	P=0.124	(e)	(e)
COCH-ARM / FISHERS	P=0.519N	(e)	(e)	P=0.167	(e)	(e)
MAX-ISO-POLY-3	(e)	(e)	(e)	P=0.013*	(e)	(e)

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Larynx						
Inflammation Chronic						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	2/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	20.2%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/8 (25%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.008**	(e)	(e)	(e)	(e)	P=0.224
POLY 1.5	P=0.008**	(e)	(e)	(e)	(e)	P=0.225
POLY 6	P=0.008**	(e)	(e)	(e)	(e)	P=0.222
COCH-ARM / FISHERS	P=0.010**	(e)	(e)	(e)	(e)	P=0.237
MAX-ISO-POLY-3	P=0.005**	(e)	(e)	(e)	(e)	P=0.066

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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Larynx: Epithelium Necrosis						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	2/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	20.2%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/8 (25%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.008**	(e)	(e)	(e)	(e)	P=0.224
POLY 1.5	P=0.008**	(e)	(e)	(e)	(e)	P=0.225
POLY 6	P=0.008**	(e)	(e)	(e)	(e)	P=0.222
COCH-ARM / FISHERS	P=0.010**	(e)	(e)	(e)	(e)	P=0.237
MAX-ISO-POLY-3	P=0.005**	(e)	(e)	(e)	(e)	P=0.066

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 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Larynx: Respiratory Epithelium Hyperplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/10 (30%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	3/10.00	1/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	30%	10.1%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/10 (30%)	1/8 (13%)
FIRST INCIDENCE	---	---	---	---	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.061	(e)	(e)	(e)	P=0.095	P=0.498
POLY 1.5	P=0.062	(e)	(e)	(e)	P=0.095	P=0.499
POLY 6	P=0.059	(e)	(e)	(e)	P=0.095	P=0.496
COCH-ARM / FISHERS	P=0.074	(e)	(e)	(e)	P=0.105	P=0.500
MAX-ISO-POLY-3	P=0.029*	(e)	(e)	(e)	P=0.025*	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Larynx: Respiratory Epithelium Metaplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	8/10 (80%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	8/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	80%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	8/10 (80%)	8/8 (100%)
FIRST INCIDENCE	---	---	---	---	93 (T)	91
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	P<0.001**	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Larynx: Respiratory Epithelium Regeneration						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	0/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Larynx: Squamous Epithelium Hyperplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	5/10 (50%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	5/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	50%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/8 (38%)
FIRST INCIDENCE	---	---	---	---	---	91
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P=0.008**
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P=0.008**
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P=0.008**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P=0.016*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Larynx: Squamous Epithelium Hyperplasia Atypical						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	2/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	20.2%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/8 (25%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.008**	(e)	(e)	(e)	(e)	P=0.224
POLY 1.5	P=0.008**	(e)	(e)	(e)	(e)	P=0.225
POLY 6	P=0.008**	(e)	(e)	(e)	(e)	P=0.222
COCH-ARM / FISHERS	P=0.010**	(e)	(e)	(e)	(e)	P=0.237
MAX-ISO-POLY-3	P=0.005**	(e)	(e)	(e)	(e)	P=0.066

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Liver						
Inflammation Chronic						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/1 (0%)	0/2 (0%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/1.00	0/2.00	0/0.00	0/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/1 (0%)	0/2 (0%)	0/0 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung Congestion						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	2/9.97
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	20.1%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/8 (13%)
FIRST INCIDENCE	---	---	---	---	---	91
STATISTICAL TESTS						
POLY 3	P=0.008**	(e)	(e)	(e)	(e)	P=0.226
POLY 1.5	P=0.008**	(e)	(e)	(e)	(e)	P=0.226
POLY 6	P=0.008**	(e)	(e)	(e)	(e)	P=0.225
COCH-ARM / FISHERS	P=0.010**	(e)	(e)	(e)	(e)	P=0.237
MAX-ISO-POLY-3	P=0.005**	(e)	(e)	(e)	(e)	P=0.066

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
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 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung Foreign Body						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	0/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
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 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung						
Infiltration Cellular Histiocyte						
LESION RATES						
OVERALL (a)	1/10 (10%)	0/10 (0%)	1/10 (10%)	0/10 (0%)	0/10 (0%)	7/10 (70%)
POLY-3 RATE (b)	1/10.00	0/10.00	1/10.00	0/10.00	0/10.00	7/9.97
POLY-3 PERCENT (g)	10%	0%	10%	0%	0%	70.2%
TERMINAL (d)	1/10 (10%)	0/10 (0%)	1/10 (10%)	0/10 (0%)	0/10 (0%)	6/8 (75%)
FIRST INCIDENCE	93 (T)	---	93 (T)	---	---	91
STATISTICAL TESTS						
POLY 3	P<0.001**	P=0.500N	P=0.760	P=0.500N	P=0.500N	P=0.003**
POLY 1.5	P<0.001**	P=0.500N	P=0.760	P=0.500N	P=0.500N	P=0.003**
POLY 6	P<0.001**	P=0.500N	P=0.760	P=0.500N	P=0.500N	P=0.003**
COCH-ARM / FISHERS	P<0.001**	P=0.500N	P=0.763N	P=0.500N	P=0.500N	P=0.010**
MAX-ISO-POLY-3	P<0.001**	P=0.158N	P=1.000	P=0.158N	P=0.158N	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
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 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung						
Inflammation Acute						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	1/9.94
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10.1%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	92
STATISTICAL TESTS						
POLY 3	P=0.106	(e)	(e)	(e)	(e)	P=0.499
POLY 1.5	P=0.106	(e)	(e)	(e)	(e)	P=0.499
POLY 6	P=0.106	(e)	(e)	(e)	(e)	P=0.498
COCH-ARM / FISHERS	P=0.105	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	P=0.041*	(e)	(e)	(e)	(e)	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung Inflammation Eosinophil						
LESION RATES						
OVERALL (a)	2/10 (20%)	0/10 (0%)	3/10 (30%)	1/10 (10%)	0/10 (0%)	6/10 (60%)
POLY-3 RATE (b)	2/10.00	0/10.00	3/10.00	1/10.00	0/10.00	6/9.97
POLY-3 PERCENT (g)	20%	0%	30%	10%	0%	60.2%
TERMINAL (d)	2/10 (20%)	0/10 (0%)	3/10 (30%)	1/10 (10%)	0/10 (0%)	5/8 (63%)
FIRST INCIDENCE	93 (T)	---	93 (T)	93 (T)	---	91
STATISTICAL TESTS						
POLY 3	P=0.004**	P=0.227N	P=0.500	P=0.500N	P=0.227N	P=0.076
POLY 1.5	P=0.004**	P=0.227N	P=0.500	P=0.500N	P=0.227N	P=0.077
POLY 6	P=0.004**	P=0.227N	P=0.500	P=0.500N	P=0.227N	P=0.075
COCH-ARM / FISHERS	P=0.009**	P=0.237N	P=0.500	P=0.500N	P=0.237N	P=0.085
MAX-ISO-POLY-3	P<0.001**	P=0.066N	P=0.310	P=0.274N	P=0.066N	P=0.028*

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
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 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung						
Metaplasia Osseous						
LESION RATES						
OVERALL (a)	1/10 (10%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/10 (10%)
POLY-3 RATE (b)	1/10.00	0/10.00	0/10.00	0/10.00	0/10.00	1/9.91
POLY-3 PERCENT (g)	10%	0%	0%	0%	0%	10.1%
TERMINAL (d)	1/10 (10%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/8 (13%)
FIRST INCIDENCE	93 (T)	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.414	P=0.500N	P=0.500N	P=0.500N	P=0.500N	P=0.758
POLY 1.5	P=0.415	P=0.500N	P=0.500N	P=0.500N	P=0.500N	P=0.759
POLY 6	P=0.413	P=0.500N	P=0.500N	P=0.500N	P=0.500N	P=0.756
COCH-ARM / FISHERS	P=0.414	P=0.500N	P=0.500N	P=0.500N	P=0.500N	P=0.763N
MAX-ISO-POLY-3	P=0.163	P=0.158N	P=0.158N	P=0.158N	P=0.158N	P=0.496

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Alveolar Epithelium Inflammation Acute Focal						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	0/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Bronchiole, Epithelium Hyperplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	5/10 (50%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	5/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	50.5%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	5/8 (63%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P=0.008**
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P=0.008**
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P=0.007**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P=0.016*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Bronchus Inflammation Chronic						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	1/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10.1%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/8 (13%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.106	(e)	(e)	(e)	(e)	P=0.498
POLY 1.5	P=0.106	(e)	(e)	(e)	(e)	P=0.499
POLY 6	P=0.105	(e)	(e)	(e)	(e)	P=0.496
COCH-ARM / FISHERS	P=0.105	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	P=0.041*	(e)	(e)	(e)	(e)	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Bronchus, Epithelium Hyperplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	4/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	40.4%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/8 (50%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P=0.032*
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P=0.032*
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P=0.031*
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P=0.043*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P=0.007**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Bronchus, Epithelium Hyperplasia Atypical						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/10 (30%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	3/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	30.3%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/8 (38%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P=0.093
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P=0.094
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P=0.091
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P=0.105
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P=0.024*

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Bronchus, Epithelium Metaplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	0/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Bronchus, Epithelium Necrosis						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	4/9.97
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	40.1%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/8 (38%)
FIRST INCIDENCE	---	---	---	---	---	91
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P=0.032*
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P=0.043*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P=0.007**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Bronchus, Epithelium Regeneration						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	5/10 (50%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	5/9.97
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	50.2%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/8 (50%)
FIRST INCIDENCE	---	---	---	---	---	91
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P=0.008**
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P=0.008**
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P=0.008**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P=0.016*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lymph Node, Mandibular Atrophy Lymphoid						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/1 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/1.00	1/9.94
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10.1%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/1 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	92
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.499
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.499
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.498
COCH-ARM / FISHERS	P=0.300	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
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 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lymph Node, Mandibular Hemorrhage						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/1 (100%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	1/1.00	0/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	100%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/1 (100%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	93 (T)	---
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	P=0.091	(e)
POLY 1.5	(e)	(e)	(e)	(e)	P=0.091	(e)
POLY 6	(e)	(e)	(e)	(e)	P=0.091	(e)
COCH-ARM / FISHERS	P=0.700	(e)	(e)	(e)	P=0.091	(e)
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	P<0.001**	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
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 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lymph Node, Mesenteric Atrophy Lymphoid						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/0.00	1/9.94
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10.1%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	92
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.499
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.499
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.498
COCH-ARM / FISHERS	P=0.304	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
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 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lymph Node: Deep Cervical Hyperplasia Lymphoid						
LESION RATES						
OVERALL (a)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)
POLY-3 RATE (b)	0/0.00	0/0.00	0/0.00	0/0.00	0/0.00	0/0.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
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 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose Inflammation						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/10 (10%)	10/10 (100%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	1/10.00	10/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	10%	100%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/10 (10%)	10/10 (100%)	8/8 (100%)
FIRST INCIDENCE	---	---	---	93 (T)	93 (T)	91
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	P=0.500	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P=0.500	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P=0.500	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.500	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.158	(e)	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Lymphoid Tissue Hyperplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/10 (30%)	9/10 (90%)	6/10 (60%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	3/10.00	9/10.00	6/9.91
POLY-3 PERCENT (g)	0%	0%	0%	30%	90%	60.6%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/10 (30%)	9/10 (90%)	6/8 (75%)
FIRST INCIDENCE	---	---	---	93 (T)	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	P=0.095	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P=0.095	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P=0.095	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.105	P<0.001**	P=0.005**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.025*	P<0.001**	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Olfactory Epithelium Atrophy						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	1/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10.1%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/8 (13%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.106	(e)	(e)	(e)	(e)	P=0.498
POLY 1.5	P=0.106	(e)	(e)	(e)	(e)	P=0.499
POLY 6	P=0.105	(e)	(e)	(e)	(e)	P=0.496
COCH-ARM / FISHERS	P=0.105	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	P=0.041*	(e)	(e)	(e)	(e)	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Olfactory Epithelium Degeneration						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/10 (30%)	9/10 (90%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	3/10.00	9/10.00	0/9.91
POLY-3 PERCENT (g)	0%	0%	0%	30%	90%	0%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/10 (30%)	9/10 (90%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	93 (T)	93 (T)	---
STATISTICAL TESTS						
POLY 3	P=0.032*	(e)	(e)	P=0.095	P<0.001**	(e)
POLY 1.5	P=0.035*	(e)	(e)	P=0.095	P<0.001**	(e)
POLY 6	P=0.029*	(e)	(e)	P=0.095	P<0.001**	(e)
COCH-ARM / FISHERS	P=0.146	(e)	(e)	P=0.105	P<0.001**	(e)
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.025*	P<0.001**	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Olfactory Epithelium Metaplasia Respiratory						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)	7/10 (70%)	9/10 (90%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	2/10.00	7/10.00	9/9.94
POLY-3 PERCENT (g)	0%	0%	0%	20%	70%	90.6%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)	7/10 (70%)	8/8 (100%)
FIRST INCIDENCE	---	---	---	93 (T)	93 (T)	92
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	P=0.227	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P=0.227	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P=0.227	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.237	P=0.002**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.066	P<0.001**	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Olfactory Epithelium Necrosis						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	9/10 (90%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	9/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	90%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	7/8 (88%)
FIRST INCIDENCE	---	---	---	---	---	91
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Respiratory Epithelium Hyperplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)	10/10 (100%)	9/10 (90%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	2/10.00	10/10.00	9/9.94
POLY-3 PERCENT (g)	0%	0%	0%	20%	100%	90.6%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)	10/10 (100%)	8/8 (100%)
FIRST INCIDENCE	---	---	---	93 (T)	93 (T)	92
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	P=0.227	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P=0.227	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P=0.227	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.237	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.066	(e)	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Respiratory Epithelium Metaplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	8/10 (80%)	10/10 (100%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	8/10.00	10/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	80%	100%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	8/10 (80%)	10/10 (100%)	8/8 (100%)
FIRST INCIDENCE	---	---	---	93 (T)	93 (T)	91
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	P<0.001**	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P<0.001**	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P<0.001**	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P<0.001**	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P<0.001**	(e)	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Respiratory Epithelium Necrosis						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	2/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	20%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)	8/8 (100%)
FIRST INCIDENCE	---	---	---	---	93 (T)	91
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	P=0.227	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	P=0.227	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	P=0.227	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	P=0.237	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	P=0.066	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Respiratory Epithelium Regeneration						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	4/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	40%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)	8/8 (100%)
FIRST INCIDENCE	---	---	---	---	93 (T)	91
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	P=0.033*	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	P=0.033*	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	P=0.033*	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	P=0.043*	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	P=0.007**	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Septum Necrosis						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	1/9.94
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10.1%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	92
STATISTICAL TESTS						
POLY 3	P=0.106	(e)	(e)	(e)	(e)	P=0.499
POLY 1.5	P=0.106	(e)	(e)	(e)	(e)	P=0.499
POLY 6	P=0.106	(e)	(e)	(e)	(e)	P=0.498
COCH-ARM / FISHERS	P=0.105	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	P=0.041*	(e)	(e)	(e)	(e)	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Turbinate Atrophy						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/10 (30%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	3/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	30%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/10 (30%)	8/8 (100%)
FIRST INCIDENCE	---	---	---	---	93 (T)	91
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	P=0.095	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	P=0.095	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	P=0.095	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	P=0.105	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	P=0.025*	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Pancreas Atrophy						
LESION RATES						
OVERALL (a)	3/10 (30%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	3/10.00	0/0.00	0/0.00	0/0.00	0/0.00	0/9.91
POLY-3 PERCENT (g)	30%	0%	0%	0%	0%	0%
TERMINAL (d)	3/10 (30%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/8 (0%)
FIRST INCIDENCE	93 (T)	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.097N
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.096N
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.098N
COCH-ARM / FISHERS	P=0.059N	(e)	(e)	(e)	(e)	P=0.105N
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.026N*

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Pancreas						
Basophilic Focus						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/0.00	1/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10.1%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/8 (13%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.498
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.499
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.496
COCH-ARM / FISHERS	P=0.304	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Pituitary Gland: Pars Distalis Cyst						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/0.00	0/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Preputial Gland Inflammation Chronic						
LESION RATES						
OVERALL (a)	3/10 (30%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	3/9 (33%)
POLY-3 RATE (b)	3/10.00	0/0.00	0/0.00	0/0.00	0/0.00	3/8.94
POLY-3 PERCENT (g)	30%	0%	0%	0%	0%	33.6%
TERMINAL (d)	3/10 (30%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	3/8 (38%)
FIRST INCIDENCE	93 (T)	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.622
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.624
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.619
COCH-ARM / FISHERS	P=0.536	(e)	(e)	(e)	(e)	P=0.630
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.436

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Prostate Inflammation Chronic						
LESION RATES						
OVERALL (a)	2/10 (20%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	6/10 (60%)
POLY-3 RATE (b)	2/10.00	0/0.00	0/0.00	0/0.00	0/0.00	6/10.00
POLY-3 PERCENT (g)	20%	0%	0%	0%	0%	60%
TERMINAL (d)	2/10 (20%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	4/8 (50%)
FIRST INCIDENCE	93 (T)	---	---	---	---	91
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.077
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.077
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.077
COCH-ARM / FISHERS	P=0.055	(e)	(e)	(e)	(e)	P=0.085
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.029*

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Spleen						
Atrophy Lymphoid						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/0.00	1/9.94
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10.1%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	92
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.499
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.499
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.498
COCH-ARM / FISHERS	P=0.304	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Thymus Atrophy Lymphoid						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/0.00	1/9.94
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10.1%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	92
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.499
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.499
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.498
COCH-ARM / FISHERS	P=0.304	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Thymus Hemorrhage						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/0.00	0/9.91
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/8 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Trachea						
Inflammation Chronic						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	2/9.97
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	20.1%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/8 (13%)
FIRST INCIDENCE	---	---	---	---	---	91
STATISTICAL TESTS						
POLY 3	P=0.008**	(e)	(e)	(e)	(e)	P=0.226
POLY 1.5	P=0.008**	(e)	(e)	(e)	(e)	P=0.226
POLY 6	P=0.008**	(e)	(e)	(e)	(e)	P=0.225
COCH-ARM / FISHERS	P=0.010**	(e)	(e)	(e)	(e)	P=0.237
MAX-ISO-POLY-3	P=0.005**	(e)	(e)	(e)	(e)	P=0.066

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Trachea: Epithelium Hyperplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)	2/10 (20%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	2/10.00	2/9.94
POLY-3 PERCENT (g)	0%	0%	0%	0%	20%	20.1%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)	1/8 (13%)
FIRST INCIDENCE	---	---	---	---	93 (T)	92
STATISTICAL TESTS						
POLY 3	P=0.012*	(e)	(e)	(e)	P=0.227	P=0.225
POLY 1.5	P=0.012*	(e)	(e)	(e)	P=0.227	P=0.226
POLY 6	P=0.012*	(e)	(e)	(e)	P=0.227	P=0.224
COCH-ARM / FISHERS	P=0.014*	(e)	(e)	(e)	P=0.237	P=0.237
MAX-ISO-POLY-3	P=0.012*	(e)	(e)	(e)	P=0.066	P=0.066

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Trachea: Epithelium Metaplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	4/9.97
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	40.1%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/8 (38%)
FIRST INCIDENCE	---	---	---	---	---	91
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P=0.032*
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P=0.043*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P=0.007**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Trachea: Epithelium Necrosis						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	8/8 (100%)
FIRST INCIDENCE	---	---	---	---	---	91
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Males					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Trachea: Epithelium Regeneration						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	9/10 (90%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	9/9.97
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	90.3%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	8/8 (100%)
FIRST INCIDENCE	---	---	---	---	---	91
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Clitoral Gland Inflammation Chronic						
LESION RATES						
OVERALL (a)	3/10 (30%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/1 (100%)	2/10 (20%)
POLY-3 RATE (b)	3/10.00	0/0.00	0/0.00	0/0.00	1/1.00	2/10.00
POLY-3 PERCENT (g)	30%	0%	0%	0%	100%	20%
TERMINAL (d)	3/10 (30%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/1 (100%)	2/10 (20%)
FIRST INCIDENCE	93 (T)	---	---	---	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	P=0.384	P=0.500N
POLY 1.5	(e)	(e)	(e)	(e)	P=0.384	P=0.500N
POLY 6	(e)	(e)	(e)	(e)	P=0.384	P=0.500N
COCH-ARM / FISHERS	P=0.402N	(e)	(e)	(e)	P=0.364	P=0.500N
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	P=0.152	P=0.310N

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Eye: Cornea						
Inflammation Acute						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/10 (10%)	3/10 (30%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	1/10.00	3/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	10%	30%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/10 (10%)	3/10 (30%)
FIRST INCIDENCE	---	---	---	---	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	P=0.500	P=0.095
POLY 1.5	(e)	(e)	(e)	(e)	P=0.500	P=0.095
POLY 6	(e)	(e)	(e)	(e)	P=0.500	P=0.095
COCH-ARM / FISHERS	P=0.050*	(e)	(e)	(e)	P=0.500	P=0.105
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	P=0.158	P=0.025*

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Eye: Cornea Mineralization						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/10.00	0/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)	0/10 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Eye: Cornea						
Neovascularization						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/10.00	1/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)	1/10 (10%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.500
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.500
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.500
COCH-ARM / FISHERS	P=0.267	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Eye: Cornea, Epithelium Vacuolation						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/10.00	1/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)	1/10 (10%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.500
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.500
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.500
COCH-ARM / FISHERS	P=0.267	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Harderian Gland Inflammation Chronic						
LESION RATES						
OVERALL (a)	1/10 (10%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	1/10.00	0/0.00	0/0.00	0/0.00	0/0.00	0/10.00
POLY-3 PERCENT (g)	10%	0%	0%	0%	0%	0%
TERMINAL (d)	1/10 (10%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
FIRST INCIDENCE	93 (T)	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.500N
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.500N
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.500N
COCH-ARM / FISHERS	P=0.304N	(e)	(e)	(e)	(e)	P=0.500N
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.158N

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Heart						
Cardiomyopathy						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/0.00	0/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Kidney Cyst						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/0.00	0/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Kidney Nephropathy						
LESION RATES						
OVERALL (a)	1/10 (10%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	1/10.00	0/0.00	0/0.00	0/0.00	0/0.00	0/10.00
POLY-3 PERCENT (g)	10%	0%	0%	0%	0%	0%
TERMINAL (d)	1/10 (10%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
FIRST INCIDENCE	93 (T)	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.500N
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.500N
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.500N
COCH-ARM / FISHERS	P=0.304N	(e)	(e)	(e)	(e)	P=0.500N
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.158N

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Kidney: Pelvis Dilatation						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/0.00	0/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Larynx						
Inflammation Chronic						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	5/10 (50%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	5/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	50%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	5/10 (50%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P=0.008**
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P=0.008**
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P=0.008**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P=0.016*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Larynx: Epithelium Necrosis						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	6/10 (60%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	6/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	60%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	6/10 (60%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P=0.005**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Larynx: Respiratory Epithelium Hyperplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	2/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	20%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.008**	(e)	(e)	(e)	(e)	P=0.227
POLY 1.5	P=0.008**	(e)	(e)	(e)	(e)	P=0.227
POLY 6	P=0.008**	(e)	(e)	(e)	(e)	P=0.227
COCH-ARM / FISHERS	P=0.010**	(e)	(e)	(e)	(e)	P=0.237
MAX-ISO-POLY-3	P=0.005**	(e)	(e)	(e)	(e)	P=0.066

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Larynx: Respiratory Epithelium Metaplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	8/10 (80%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	8/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	80%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	8/10 (80%)	10/10 (100%)
FIRST INCIDENCE	---	---	---	---	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	P<0.001**	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Larynx: Respiratory Epithelium Regeneration						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	1/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/10 (10%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.107	(e)	(e)	(e)	(e)	P=0.500
POLY 1.5	P=0.107	(e)	(e)	(e)	(e)	P=0.500
POLY 6	P=0.107	(e)	(e)	(e)	(e)	P=0.500
COCH-ARM / FISHERS	P=0.105	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	P=0.041*	(e)	(e)	(e)	(e)	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Larynx: Squamous Epithelium Hyperplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	9/10 (90%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	9/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	90%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	9/10 (90%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Larynx: Squamous Epithelium Hyperplasia Atypical						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Liver						
Inflammation Chronic						
LESION RATES						
OVERALL (a)	1/10 (10%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	1/10.00	0/0.00	0/0.00	0/0.00	0/0.00	0/10.00
POLY-3 PERCENT (g)	10%	0%	0%	0%	0%	0%
TERMINAL (d)	1/10 (10%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
FIRST INCIDENCE	93 (T)	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.500N
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.500N
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.500N
COCH-ARM / FISHERS	P=0.304N	(e)	(e)	(e)	(e)	P=0.500N
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.158N

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung Congestion						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
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 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung Foreign Body						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	2/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	20%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.008**	(e)	(e)	(e)	(e)	P=0.227
POLY 1.5	P=0.008**	(e)	(e)	(e)	(e)	P=0.227
POLY 6	P=0.008**	(e)	(e)	(e)	(e)	P=0.227
COCH-ARM / FISHERS	P=0.010**	(e)	(e)	(e)	(e)	P=0.237
MAX-ISO-POLY-3	P=0.005**	(e)	(e)	(e)	(e)	P=0.066

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
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 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung						
Infiltration Cellular Histiocyte						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/10 (30%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	3/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	30%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/10 (30%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P=0.095
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P=0.095
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P=0.095
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P=0.105
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P=0.025*

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung						
Inflammation Acute						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	1/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/10 (10%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.107	(e)	(e)	(e)	(e)	P=0.500
POLY 1.5	P=0.107	(e)	(e)	(e)	(e)	P=0.500
POLY 6	P=0.107	(e)	(e)	(e)	(e)	P=0.500
COCH-ARM / FISHERS	P=0.105	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	P=0.041*	(e)	(e)	(e)	(e)	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung Inflammation Eosinophil						
LESION RATES						
OVERALL (a)	4/10 (40%)	3/10 (30%)	0/10 (0%)	1/10 (10%)	1/10 (10%)	7/10 (70%)
POLY-3 RATE (b)	4/10.00	3/10.00	0/10.00	1/10.00	1/10.00	7/10.00
POLY-3 PERCENT (g)	40%	30%	0%	10%	10%	70%
TERMINAL (d)	4/10 (40%)	3/10 (30%)	0/10 (0%)	1/10 (10%)	1/10 (10%)	7/10 (70%)
FIRST INCIDENCE	93 (T)	93 (T)	---	93 (T)	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.008**	P=0.500N	P=0.033N*	P=0.148N	P=0.148N	P=0.186
POLY 1.5	P=0.008**	P=0.500N	P=0.033N*	P=0.148N	P=0.148N	P=0.186
POLY 6	P=0.008**	P=0.500N	P=0.033N*	P=0.148N	P=0.148N	P=0.186
COCH-ARM / FISHERS	P=0.016*	P=0.500N	P=0.043N*	P=0.152N	P=0.152N	P=0.185
MAX-ISO-POLY-3	P=0.002**	P=0.325N	P=0.007N**	P=0.058N	P=0.058N	P=0.089

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
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 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung						
Metaplasia Osseous						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Alveolar Epithelium Inflammation Acute Focal						
LESION RATES						
OVERALL (a)	0/10 (0%)	1/10 (10%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	1/10.00	0/10.00	0/10.00	0/10.00	0/10.00
POLY-3 PERCENT (g)	0%	10%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	1/10 (10%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
FIRST INCIDENCE	---	93 (T)	---	---	---	---
STATISTICAL TESTS						
POLY 3	P=0.484N	P=0.500	(e)	(e)	(e)	(e)
POLY 1.5	P=0.484N	P=0.500	(e)	(e)	(e)	(e)
POLY 6	P=0.484N	P=0.500	(e)	(e)	(e)	(e)
COCH-ARM / FISHERS	P=0.484N	P=0.500	(e)	(e)	(e)	(e)
MAX-ISO-POLY-3	P=0.193N	P=0.158	(e)	(e)	(e)	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Bronchiole, Epithelium Hyperplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	8/10 (80%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	8/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	80%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	8/10 (80%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Bronchus Inflammation Chronic						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Bronchus, Epithelium Hyperplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	5/10 (50%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	5/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	50%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	5/10 (50%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P=0.008**
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P=0.008**
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P=0.008**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P=0.016*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Bronchus, Epithelium Hyperplasia Atypical						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	4/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	40%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P=0.043*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P=0.007**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Bronchus, Epithelium Metaplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	2/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	20%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.008**	(e)	(e)	(e)	(e)	P=0.227
POLY 1.5	P=0.008**	(e)	(e)	(e)	(e)	P=0.227
POLY 6	P=0.008**	(e)	(e)	(e)	(e)	P=0.227
COCH-ARM / FISHERS	P=0.010**	(e)	(e)	(e)	(e)	P=0.237
MAX-ISO-POLY-3	P=0.005**	(e)	(e)	(e)	(e)	P=0.066

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Bronchus, Epithelium Necrosis						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	2/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	20%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.008**	(e)	(e)	(e)	(e)	P=0.227
POLY 1.5	P=0.008**	(e)	(e)	(e)	(e)	P=0.227
POLY 6	P=0.008**	(e)	(e)	(e)	(e)	P=0.227
COCH-ARM / FISHERS	P=0.010**	(e)	(e)	(e)	(e)	P=0.237
MAX-ISO-POLY-3	P=0.005**	(e)	(e)	(e)	(e)	P=0.066

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lung: Bronchus, Epithelium Regeneration						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	4/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	40%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P=0.043*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P=0.007**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lymph Node, Mandibular Atrophy Lymphoid						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/1 (0%)	0/0 (0%)	0/9 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/1.00	0/0.00	0/9.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/1 (0%)	0/0 (0%)	0/9 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lymph Node, Mandibular Hemorrhage						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/1 (0%)	0/0 (0%)	0/9 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/1.00	0/0.00	0/9.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/1 (0%)	0/0 (0%)	0/9 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lymph Node, Mesenteric Atrophy Lymphoid						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/0.00	0/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Lymph Node: Deep Cervical Hyperplasia Lymphoid						
LESION RATES						
OVERALL (a)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/1 (100%)
POLY-3 RATE (b)	0/0.00	0/0.00	0/0.00	0/0.00	0/0.00	1/1.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	100%
TERMINAL (d)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/1 (100%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	(e)
POLY 1.5	(e)	(e)	(e)	(e)	(e)	(e)
POLY 6	(e)	(e)	(e)	(e)	(e)	(e)
COCH-ARM / FISHERS	(e)	(e)	(e)	(e)	(e)	(e)
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose Inflammation						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	10/10 (100%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	10/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	100%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	10/10 (100%)	10/10 (100%)
FIRST INCIDENCE	---	---	---	---	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Lymphoid Tissue Hyperplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	1/10 (10%)	0/10 (0%)	2/10 (20%)	8/10 (80%)	6/10 (60%)
POLY-3 RATE (b)	0/10.00	1/10.00	0/10.00	2/10.00	8/10.00	6/10.00
POLY-3 PERCENT (g)	0%	10%	0%	20%	80%	60%
TERMINAL (d)	0/10 (0%)	1/10 (10%)	0/10 (0%)	2/10 (20%)	8/10 (80%)	6/10 (60%)
FIRST INCIDENCE	---	93 (T)	---	93 (T)	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	P=0.500	(e)	P=0.227	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	P=0.500	(e)	P=0.227	P<0.001**	P<0.001**
POLY 6	P<0.001**	P=0.500	(e)	P=0.227	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	P=0.500	(e)	P=0.237	P<0.001**	P=0.005**
MAX-ISO-POLY-3	P<0.001**	P=0.158	(e)	P=0.066	P<0.001**	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Olfactory Epithelium Atrophy						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	4/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	40%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P=0.043*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P=0.007**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Olfactory Epithelium Degeneration						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)	9/10 (90%)	4/10 (40%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	4/10.00	9/10.00	4/10.00
POLY-3 PERCENT (g)	0%	0%	0%	40%	90%	40%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)	9/10 (90%)	4/10 (40%)
FIRST INCIDENCE	---	---	---	93 (T)	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	P=0.033*	P<0.001**	P=0.033*
POLY 1.5	P<0.001**	(e)	(e)	P=0.033*	P<0.001**	P=0.033*
POLY 6	P<0.001**	(e)	(e)	P=0.033*	P<0.001**	P=0.033*
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.043*	P<0.001**	P=0.043*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P=0.007**	P<0.001**	P=0.007**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Olfactory Epithelium Metaplasia Respiratory						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	10/10 (100%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	10/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	100%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	10/10 (100%)	10/10 (100%)
FIRST INCIDENCE	---	---	---	---	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Olfactory Epithelium Necrosis						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	4/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	40%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P=0.033*
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P=0.043*
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P=0.007**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Respiratory Epithelium Hyperplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	10/10 (100%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	10/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	100%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	10/10 (100%)	10/10 (100%)
FIRST INCIDENCE	---	---	---	---	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Respiratory Epithelium Metaplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	5/10 (50%)	10/10 (100%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	5/10.00	10/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	50%	100%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	5/10 (50%)	10/10 (100%)	10/10 (100%)
FIRST INCIDENCE	---	---	---	93 (T)	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	P=0.008**	P<0.001**	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	P=0.008**	P<0.001**	P<0.001**
POLY 6	P<0.001**	(e)	(e)	P=0.008**	P<0.001**	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	P=0.016*	P<0.001**	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	P<0.001**	(e)	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Respiratory Epithelium Necrosis						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/10 (30%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	3/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	30%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/10 (30%)	10/10 (100%)
FIRST INCIDENCE	---	---	---	---	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	P=0.095	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	P=0.095	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	P=0.095	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	P=0.105	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	P=0.025*	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Respiratory Epithelium Regeneration						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/10 (30%)	9/10 (90%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	3/10.00	9/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	30%	90%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	3/10 (30%)	9/10 (90%)
FIRST INCIDENCE	---	---	---	---	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	P=0.095	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	P=0.095	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	P=0.095	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	P=0.105	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	P=0.025*	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Septum						
Necrosis						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	2/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	20%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.008**	(e)	(e)	(e)	(e)	P=0.227
POLY 1.5	P=0.008**	(e)	(e)	(e)	(e)	P=0.227
POLY 6	P=0.008**	(e)	(e)	(e)	(e)	P=0.227
COCH-ARM / FISHERS	P=0.010**	(e)	(e)	(e)	(e)	P=0.237
MAX-ISO-POLY-3	P=0.005**	(e)	(e)	(e)	(e)	P=0.066

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Nose: Turbinate Atrophy						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	4/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	40%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	4/10 (40%)	10/10 (100%)
FIRST INCIDENCE	---	---	---	---	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	P=0.033*	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	P=0.033*	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	P=0.033*	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	P=0.043*	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	P=0.007**	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Ovary Cyst						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/0.00	1/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/10 (10%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.500
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.500
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.500
COCH-ARM / FISHERS	P=0.304	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Pancreas Atrophy						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/0.00	0/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Pancreas						
Basophilic Focus						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/0.00	0/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/10 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Pituitary Gland: Pars Distalis Cyst						
LESION RATES						
OVERALL (a)	1/10 (10%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/10 (10%)
POLY-3 RATE (b)	1/10.00	0/0.00	0/0.00	0/0.00	0/0.00	1/10.00
POLY-3 PERCENT (g)	10%	0%	0%	0%	0%	10%
TERMINAL (d)	1/10 (10%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	1/10 (10%)
FIRST INCIDENCE	93 (T)	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.760
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.760
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.760
COCH-ARM / FISHERS	P=0.645	(e)	(e)	(e)	(e)	P=0.763N
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=1.000

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Spleen						
Atrophy Lymphoid						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	2/10 (20%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/0.00	0/0.00	2/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	20%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	0/0 (0%)	2/10 (20%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.227
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.227
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.227
COCH-ARM / FISHERS	P=0.132	(e)	(e)	(e)	(e)	P=0.237
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.066

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Thymus Atrophy Lymphoid						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/1 (0%)	0/0 (0%)	1/9 (11%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	0/1.00	0/0.00	1/9.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	11.1%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	0/1 (0%)	0/0 (0%)	1/9 (11%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	(e)	(e)	P=0.479
POLY 1.5	(e)	(e)	(e)	(e)	(e)	P=0.479
POLY 6	(e)	(e)	(e)	(e)	(e)	P=0.479
COCH-ARM / FISHERS	P=0.273	(e)	(e)	(e)	(e)	P=0.474
MAX-ISO-POLY-3	(e)	(e)	(e)	(e)	(e)	P=0.150

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

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 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Thymus Hemorrhage						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/0 (0%)	0/0 (0%)	1/1 (100%)	0/0 (0%)	0/9 (0%)
POLY-3 RATE (b)	0/10.00	0/0.00	0/0.00	1/1.00	0/0.00	0/9.00
POLY-3 PERCENT (g)	0%	0%	0%	100%	0%	0%
TERMINAL (d)	0/10 (0%)	0/0 (0%)	0/0 (0%)	1/1 (100%)	0/0 (0%)	0/9 (0%)
FIRST INCIDENCE	---	---	---	93 (T)	---	---
STATISTICAL TESTS						
POLY 3	(e)	(e)	(e)	P=0.091	(e)	(e)
POLY 1.5	(e)	(e)	(e)	P=0.091	(e)	(e)
POLY 6	(e)	(e)	(e)	P=0.091	(e)	(e)
COCH-ARM / FISHERS	P=0.531N	(e)	(e)	P=0.091	(e)	(e)
MAX-ISO-POLY-3	(e)	(e)	(e)	P<0.001**	(e)	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Trachea						
Inflammation Chronic						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/10 (10%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	1/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	10%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/10 (10%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P=0.107	(e)	(e)	(e)	(e)	P=0.500
POLY 1.5	P=0.107	(e)	(e)	(e)	(e)	P=0.500
POLY 6	P=0.107	(e)	(e)	(e)	(e)	P=0.500
COCH-ARM / FISHERS	P=0.105	(e)	(e)	(e)	(e)	P=0.500
MAX-ISO-POLY-3	P=0.041*	(e)	(e)	(e)	(e)	P=0.158

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Trachea: Epithelium Hyperplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	9/10 (90%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	9/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	90%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	9/10 (90%)
FIRST INCIDENCE	---	---	---	---	---	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	(e)	P<0.001**

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Trachea: Epithelium Metaplasia						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00	0/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	0%	0%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)
FIRST INCIDENCE	---	---	---	---	---	---
STATISTICAL TESTS						
POLY 3	(n)	(n)	(n)	(n)	(n)	(n)
POLY 1.5	(n)	(n)	(n)	(n)	(n)	(n)
POLY 6	(n)	(n)	(n)	(n)	(n)	(n)
COCH-ARM / FISHERS	(n)	(n)	(n)	(n)	(n)	(n)
MAX-ISO-POLY-3	(n)	(n)	(n)	(n)	(n)	(n)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
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 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Trachea: Epithelium Necrosis						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/10 (10%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	1/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	10%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	1/10 (10%)	10/10 (100%)
FIRST INCIDENCE	---	---	---	---	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	P=0.500	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	P=0.500	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	P=0.500	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	P=0.500	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	P=0.158	(e)

Experiment Number: 20725 - 01
 Test Type: 90-DAY
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
 2,3-Butanedione
 CAS Number: 431-03-8

Date Report Requested: 01/12/2017
 Time Report Requested: 15:54:18
 First Dose M/F: 07/28/08 / 07/29/08
 Lab: BNW

**STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS IN RATS(Wistar Han)
 TERMINAL SACRIFICE AT 14 WEEKS**

DOSE	Females					
	CONTROL	6.25 ppm	12.5 ppm	25 ppm	50 ppm	100 ppm
Trachea: Epithelium Regeneration						
LESION RATES						
OVERALL (a)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)	10/10 (100%)
POLY-3 RATE (b)	0/10.00	0/10.00	0/10.00	0/10.00	2/10.00	10/10.00
POLY-3 PERCENT (g)	0%	0%	0%	0%	20%	100%
TERMINAL (d)	0/10 (0%)	0/10 (0%)	0/10 (0%)	0/10 (0%)	2/10 (20%)	10/10 (100%)
FIRST INCIDENCE	---	---	---	---	93 (T)	93 (T)
STATISTICAL TESTS						
POLY 3	P<0.001**	(e)	(e)	(e)	P=0.227	P<0.001**
POLY 1.5	P<0.001**	(e)	(e)	(e)	P=0.227	P<0.001**
POLY 6	P<0.001**	(e)	(e)	(e)	P=0.227	P<0.001**
COCH-ARM / FISHERS	P<0.001**	(e)	(e)	(e)	P=0.237	P<0.001**
MAX-ISO-POLY-3	P<0.001**	(e)	(e)	(e)	P=0.066	(e)

Experiment Number: 20725 - 01
Test Type: 90-DAY
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/Wistar Han

P10: STATISTICAL ANALYSIS OF NON-NEOPLASTIC LESIONS
2,3-Butanedione
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LEGEND

- (a) Number of tumor-bearing animals/number of animals examined at site.
 - (b) Number of tumor-bearing animals/Poly-3 number
 - (d) Observed incidence at terminal kill.
 - (e) Value of statistic cannot be computed.
 - (f) Beneath the control incidence are the P-values associated with the trend test. Beneath the dosed group incidence are the P-values corresponding to pairwise comparisons between the controls and that dosed group.
 - (g) Poly-3 adjusted lifetime tumor incidence.
 - (n) No statistics are calculated if all dose groups have fewer than two tumors.
 - (I) Interim sacrifice
 - (T) Terminal sacrifice
 - # Tumor rates based on numbers of animals necropsied.
 - * To the right of any statistical result, indicates significance at ($P \leq 0.05$).
 - ** To the right of any statistical result, indicates significance at ($P \leq 0.01$).
 - N Indicates a negative trend for all tests
- The Cochran-Armitage and Fishers exact tests compare directly the overall incidence rates.

*** END OF REPORT ***