

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**

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

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1

**TRT#:** 1

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** CONTROL

**DISP:** Terminal Sacrifice

**HISTO:** 57864

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**ORGAN AND ACCOUNTABLE SITE STATUS**

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**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	* Skin	* Spleen
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thymus
* Thyroid Gland	* Trachea	* Urinary Bladder	

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**MISSING**

\* Mammary Gland

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

**ANIMAL ID:** 2

**TRT#:** 1

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** CONTROL

**DISP:** Terminal Sacrifice

**HISTO:** 57865

**ORGAN AND ACCOUNTABLE SITE STATUS**

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Liver
* Lung	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Nose	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Spleen
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thymus
* Thyroid Gland	* Trachea	* Urinary Bladder	

**MISSING**

* Lymph Node, Bronchial	* Mammary Gland
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**OBSERVATIONS**

* Heart	Cardiomyopathy	Minimal
* Pancreas	Atrophy	Minimal
* Prostate	Inflammation	Chronic Active, Mild

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 3

TRT#: 1

SEX: Male

DAY ON TEST: 93

DOSE: CONTROL

DISP: Terminal Sacrifice

HISTO: 57866

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Spleen	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thymus	* Thyroid Gland
* Trachea	* Urinary Bladder		

OBSERVATIONS

* Lung	Inflammation	Eosinophil, Minimal
* Pancreas	Atrophy	Mild

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 4

TRT#: 1

SEX: Male

DAY ON TEST: 93

DOSE: CONTROL

DISP: Terminal Sacrifice

HISTO: 57867

ORGAN AND ACCOUNTABLE SITE STATUS

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Salivary Glands	* Seminal Vesicle	* Skin
* Spleen	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thymus	* Thyroid Gland	* Trachea	* Urinary Bladder

**MISSING**

\* Mammary Gland

**OBSERVATIONS**

* Lung	Metaplasia	Osseous, Minimal
* Preputial Gland	Inflammation	Chronic Active, Minimal
* Prostate	Inflammation	Chronic Active, Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 5

TRT#: 1

SEX: Male

DAY ON TEST: 93

DOSE: CONTROL

DISP: Terminal Sacrifice

HISTO: 57868

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Spleen	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thymus	* Thyroid Gland
* Trachea	* Urinary Bladder		

MISSING

\* Mammary Gland

OBSERVATIONS

\* Preputial Gland

Inflammation

Chronic Active, Minimal

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 6

**TRT#:** 1

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** CONTROL

**DISP:** Terminal Sacrifice

**HISTO:** 57869

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**ORGAN AND ACCOUNTABLE SITE STATUS**

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**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Spleen	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thymus	* Thyroid Gland	* Trachea	* Urinary Bladder

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 7

**TRT#:** 1

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** CONTROL

**DISP:** Terminal Sacrifice

**HISTO:** 57870

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**ORGAN AND ACCOUNTABLE SITE STATUS**

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**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Nose	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Prostate
* Salivary Glands	* Seminal Vesicle	* Skin	* Spleen
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thymus
* Thyroid Gland	* Trachea	* Urinary Bladder	

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**MISSING**

\* Mammary Gland

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 8

TRT#: 1

SEX: Male

DAY ON TEST: 93

DOSE: CONTROL

DISP: Terminal Sacrifice

HISTO: 57871

ORGAN AND ACCOUNTABLE SITE STATUS

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Parathyroid Gland	* Pituitary Gland
* Preputial Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Spleen	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thymus	* Thyroid Gland	* Trachea
* Urinary Bladder			

**MISSING**

\* Mammary Gland

**OBSERVATIONS**

* Lung	Inflammation	Eosinophil, Minimal
* Pancreas	Atrophy	Mild

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 9

**TRT#:** 1

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** CONTROL

**DISP:** Terminal Sacrifice

**HISTO:** 57872

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**ORGAN AND ACCOUNTABLE SITE STATUS**

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**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lung	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Preputial Gland	* Prostate	* Salivary Glands
* Seminal Vesicle	* Skin	* Spleen	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thymus	* Thyroid Gland
* Trachea	* Urinary Bladder		

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**MISSING**

* Lymph Node, Bronchial	* Mammary Gland
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Experiment Number: 20725 - 01  
Test Type: 90-DAY  
Route: RESPIRATORY EXPOSURE WHOLE BODY  
Species/Strain: RATS/Wistar Han

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 10

TRT#: 1

SEX: Male

DAY ON TEST: 93

DOSE: CONTROL

DISP: Terminal Sacrifice

HISTO: 57873

ORGAN AND ACCOUNTABLE SITE STATUS

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Nose	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Prostate	* Salivary Glands	* Seminal Vesicle
* Skin	* Spleen	* Stomach, Forestomach	* Stomach, Glandular
* Testes	* Thymus	* Thyroid Gland	* Trachea
* Urinary Bladder			

**MISSING**

\* Mammary Gland

**OBSERVATIONS**

* Lung	Infiltration Cellular	Histiocyte, Minimal
* Preputial Gland	Inflammation	Chronic Active, Minimal

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 201

**TRT#:** 3

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57964

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**ORGAN AND ACCOUNTABLE SITE STATUS**

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**NORMAL**

Larynx

Lung

Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 202

**TRT#:** 3

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57965

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 203

**TRT#:** 3

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57966

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 204

**TRT#:** 3

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57967

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 205

**TRT#:** 3

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57968

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 206

**TRT#:** 3

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57969

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 207

**TRT#:** 3

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57970

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 208

**TRT#:** 3

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57971

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 209

**TRT#:** 3

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57972

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 210

**TRT#:** 3

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57973

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 401

**TRT#:** 5

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57944

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 402

**TRT#:** 5

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57945

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 403

**TRT#:** 5

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57946

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

\* Nose

Trachea

---

**OBSERVATIONS**

Lung

Infiltration Cellular  
Inflammation

Histiocyte, Minimal  
Eosinophil, Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 404

**TRT#:** 5

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57947

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx  
Trachea

Liver

Lung

\* Nose

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 405

**TRT#:** 5

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57948

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 406

**TRT#:** 5

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57949

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 407

**TRT#:** 5

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57950

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 408

**TRT#:** 5

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57951

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 409

**TRT#:** 5

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57952

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

\* Nose

Trachea

---

**OBSERVATIONS**

Lung

Inflammation

Eosinophil, Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 410

**TRT#:** 5

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57953

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

\* Nose

Trachea

---

**OBSERVATIONS**

Lung

Inflammation

Eosinophil, Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 601

**TRT#:** 7

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57924

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Trachea

---

**OBSERVATIONS**

\* Nose

Olfactory Epi

Degeneration

Minimal

Respirat Epith

Hyperplasia

Minimal

Lymphoid Tiss

Hyperplasia

Minimal

Respirat Epith

Metaplasia

Squamous, Minimal

---

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 602

TRT#: 7

SEX: Male

DAY ON TEST: 93

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 57925

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Larynx

Lung

Trachea

OBSERVATIONS

\* Nose

Olfactory Epi

Degeneration

Minimal

Respirat Epith

Hyperplasia

Minimal

Lymphoid Tiss

Hyperplasia

Minimal

Inflammation

Suppurative, Minimal

Olfactory Epi

Metaplasia

Respiratory, Minimal

Respirat Epith

Metaplasia

Squamous, Minimal

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 603

**TRT#:** 7

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57926

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Liver

Lung

Trachea

---

**OBSERVATIONS**

\* Nose

Respirat Epith

Metaplasia

Squamous, Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 604

**TRT#:** 7

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57927

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 605

**TRT#:** 7

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57928

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Liver

Trachea

---

**OBSERVATIONS**

Lung

Inflammation

Eosinophil, Minimal

\* Nose

Respirat Epith

Metaplasia

Squamous, Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 606

**TRT#:** 7

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57929

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Trachea

---

**OBSERVATIONS**

\* Nose

Respirat Epith

Metaplasia

Squamous, Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 607

**TRT#:** 7

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57930

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 608

TRT#: 7

SEX: Male

DAY ON TEST: 93

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 57931

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Larynx

Lung

Trachea

OBSERVATIONS

\* Nose

Olfactory Epi

Degeneration

Minimal

Olfactory Epi

Metaplasia

Respiratory, Minimal

Respirat Epith

Metaplasia

Squamous, Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 609

TRT#: 7

SEX: Male

DAY ON TEST: 93

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 57932

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Larynx

Lung

Trachea

OBSERVATIONS

Kidney

Cyst

Moderate

Nephropathy

Mild

[ Cyst TGLs = 1-15 ]

\* Nose

Lymphoid Tiss

Hyperplasia

Minimal

Respirat Epith

Metaplasia

Squamous, Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

---

ANIMAL ID: 610

TRT#: 7

SEX: Male

DAY ON TEST: 93

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 57933

---

ORGAN AND ACCOUNTABLE SITE STATUS

---

NORMAL

Larynx

Lung

Trachea

---

OBSERVATIONS

Kidney

Pelvis

Dilatation

Mild

[ Dilatation TGLs = 1-7 ]

\* Nose

Respirat Epith

Metaplasia

Squamous, Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
 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

**ANIMAL ID:** 801

**TRT#:** 9

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 50 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57904

**ORGAN AND ACCOUNTABLE SITE STATUS**

**NORMAL**

Eye

\* Lung

Skin

**OBSERVATIONS**

\* Larynx

Respirat Epith

Hyperplasia

Mild

Respirat Epith

Metaplasia

Squamous, Mild

\* Nose

Olfactory Epi

Degeneration

Mild

Respirat Epith

Hyperplasia

Mild

Lymphoid Tiss

Hyperplasia

Mild

Inflammation

Suppurative, Moderate

Respirat Epith

Metaplasia

Squamous, Moderate

Respirat Epith

Regeneration

Minimal

\* Trachea

Epithelium

Hyperplasia

Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 802

TRT#: 9

SEX: Male

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57905

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Eye

\* Larynx

\* Lung

\* Trachea

OBSERVATIONS

Lymph Node, Mandibular  
[ Hemorrhage TGLs = 1-14 ]

Hemorrhage

Mild

\* Nose

Olfactory Epi  
Respirat Epith  
Lymphoid Tiss  
Respirat Epith

Degeneration  
Hyperplasia  
Hyperplasia  
Inflammation  
Metaplasia

Mild  
Mild  
Mild  
Suppurative, Moderate  
Squamous, Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 803

TRT#: 9

SEX: Male

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57906

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Eye

\* Larynx

\* Lung

\* Trachea

OBSERVATIONS

\* Nose

Turbinate

Atrophy

Minimal

Olfactory Epi

Degeneration

Mild

Respirat Epith

Hyperplasia

Moderate

Lymphoid Tiss

Hyperplasia

Minimal

Inflammation

Suppurative, Mild

Olfactory Epi

Metaplasia

Respiratory, Minimal

Respirat Epith

Metaplasia

Squamous, Moderate

Respirat Epith

Necrosis

Minimal

Respirat Epith

Regeneration

Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 804

TRT#: 9

SEX: Male

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57907

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Eye

\* Lung

OBSERVATIONS

\* Larynx

Respirat Epith

Hyperplasia

Minimal

Respirat Epith

Metaplasia

Squamous, Minimal

\* Nose

Olfactory Epi

Degeneration

Mild

Respirat Epith

Hyperplasia

Moderate

Lymphoid Tiss

Hyperplasia

Minimal

Inflammation

Suppurative, Moderate

Respirat Epith

Metaplasia

Squamous, Mild

Respirat Epith

Regeneration

Minimal

\* Trachea

Epithelium

Hyperplasia

Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 805

TRT#: 9

SEX: Male

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57908

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Eye

\* Lung

\* Trachea

OBSERVATIONS

\* Larynx

Respirat Epith

Metaplasia

Squamous, Minimal

\* Nose

Respirat Epith

Hyperplasia

Moderate

Lymphoid Tiss

Hyperplasia

Mild

Inflammation

Suppurative, Mild

Olfactory Epi

Metaplasia

Respiratory, Mild

Respirat Epith

Metaplasia

Squamous, Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 806

TRT#: 9

SEX: Male

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57909

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Eye

\* Lung

\* Trachea

OBSERVATIONS

\* Larynx

Respirat Epith

Metaplasia

Squamous, Mild

\* Nose

Turbinate

Atrophy

Minimal

Olfactory Epi

Degeneration

Minimal

Respirat Epith

Hyperplasia

Moderate

Inflammation

Suppurative, Moderate

Olfactory Epi

Metaplasia

Respiratory, Mild

Respirat Epith

Metaplasia

Squamous, Moderate

Respirat Epith

Necrosis

Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 807

TRT#: 9

SEX: Male

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57910

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

\* Lung

\* Trachea

OBSERVATIONS

Eye	Cornea	Mineralization	Minimal
* Larynx	Respirat Epith	Hyperplasia	Minimal
	Respirat Epith	Metaplasia	Squamous, Mild
* Nose	Turbinate	Atrophy	Minimal
	Olfactory Epi	Degeneration	Minimal
	Respirat Epith	Hyperplasia	Mild
	Lymphoid Tiss	Hyperplasia	Mild
		Inflammation	Suppurative, Mild
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Respirat Epith	Metaplasia	Squamous, Moderate
	Respirat Epith	Regeneration	Minimal

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
 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

**ANIMAL ID:** 808

**TRT#:** 9

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 50 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57911

**ORGAN AND ACCOUNTABLE SITE STATUS**

**NORMAL**

Eye

\* Lung

\* Trachea

**OBSERVATIONS**

\* Larynx

Respirat Epith

Metaplasia

Squamous, Minimal

\* Nose

Olfactory Epi

Degeneration

Minimal

Respirat Epith

Hyperplasia

Moderate

Lymphoid Tiss

Hyperplasia

Minimal

Inflammation

Suppurative, Mild

Respirat Epith

Metaplasia

Squamous, Minimal

Olfactory Epi

Metaplasia

Respiratory, Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 809

TRT#: 9

SEX: Male

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57912

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Eye

\* Lung

\* Trachea

OBSERVATIONS

\* Larynx

Respirat Epith

Metaplasia

Squamous, Minimal

\* Nose

Olfactory Epi

Degeneration

Minimal

Respirat Epith

Hyperplasia

Moderate

Lymphoid Tiss

Hyperplasia

Mild

Inflammation

Suppurative, Moderate

Olfactory Epi

Metaplasia

Respiratory, Mild

Respirat Epith

Metaplasia

Squamous, Moderate

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 810

TRT#: 9

SEX: Male

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57913

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Eye

\* Lung

\* Trachea

OBSERVATIONS

\* Larynx

Respirat Epith

Metaplasia

Squamous, Minimal

\* Nose

Olfactory Epi

Degeneration

Mild

Respirat Epith

Hyperplasia

Mild

Lymphoid Tiss

Hyperplasia

Mild

Inflammation

Suppurative, Mild

Olfactory Epi

Metaplasia

Respiratory, Mild

Respirat Epith

Metaplasia

Squamous, Moderate

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1001

TRT#: 11

SEX: Male

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57884

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Spleen	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thymus	* Thyroid Gland	* Urinary Bladder	

OBSERVATIONS

* Larynx	Squam Epithel	Hyperplasia Inflammation	Atypical, Mild Chronic Active, Minimal
	Respirat Epith Epithelium	Metaplasia Necrosis	Squamous, Marked Mild
* Lung	Bronchus, Epithelium	Hyperplasia Infiltration Cellular	Atypical, Mild Histiocyte, Minimal
	Bronchus	Inflammation Metaplasia	Chronic, Minimal Osseous, Minimal
* Nose	Turbinate	Atrophy	Mild
	Respirat Epith	Hyperplasia Inflammation	Mild Suppurative, Moderate
	Respirat Epith	Metaplasia	Squamous, Marked
	Olfactory Epi	Metaplasia	Respiratory, Minimal
	Respirat Epith	Necrosis	Moderate
	Olfactory Epi	Necrosis	Mild
	Respirat Epith	Regeneration	Minimal
* Preputial Gland		Inflammation	Chronic Active, Minimal
* Trachea		Inflammation	Chronic Active, Minimal
	Epithelium	Necrosis	Marked

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1001

**TRT#:** 11

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 100 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57884

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**ORGAN AND ACCOUNTABLE SITE STATUS**

---

Epithelium

Regeneration

Mild

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1002

TRT#: 11

SEX: Male

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57885

ORGAN AND ACCOUNTABLE SITE STATUS

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Liver	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Spleen	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thymus	* Thyroid Gland
* Urinary Bladder			

**MISSING**

\* Lymph Node, Mediastinal

**OBSERVATIONS**

* Kidney		Nephropathy	Minimal
* Larynx	Squam Epithel	Hyperplasia	Atypical, Mild
	Respirat Epith	Metaplasia	Squamous, Marked
	Epithelium	Necrosis	Mild
* Lung		Congestion	Mild
	Bronchus, Epithelium	Hyperplasia	Minimal
		Infiltration Cellular	Histiocyte, Minimal
	Bronchus, Epithelium	Regeneration	Mild
	[ Congestion TGLs = 1-15 ]		
* Nose	Turbinate	Atrophy	Mild
	Respirat Epith	Hyperplasia	Moderate
	Lymphoid Tiss	Hyperplasia	Mild
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Mild
	Olfactory Epi	Necrosis	Mild
	Respirat Epith	Necrosis	Mild

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1002

**TRT#:** 11

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 100 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57885

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**ORGAN AND ACCOUNTABLE SITE STATUS**

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* Prostate	Respirat Epith	Regeneration	Minimal
* Trachea		Inflammation	Chronic Active, Mild
	Epithelium	Metaplasia	Squamous, Minimal
	Epithelium	Necrosis	Marked
	Epithelium	Regeneration	Minimal

---

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1003

TRT#: 11

SEX: Male

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57886

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

- |                            |                           |                             |                          |
|----------------------------|---------------------------|-----------------------------|--------------------------|
| * Adrenal Cortex           | * Adrenal Medulla         | Blood Vessel                | * Bone                   |
| * Bone Marrow              | * Brain                   | * Epididymis                | * Esophagus              |
| * Eye                      | * Harderian Gland         | * Heart                     | * Intestine Large, Cecum |
| * Intestine Large, Colon   | * Intestine Large, Rectum | * Intestine Small, Duodenum | * Intestine Small, Ileum |
| * Intestine Small, Jejunum | * Islets, Pancreatic      | * Kidney                    | * Liver                  |
| * Lymph Node, Bronchial    | * Lymph Node, Mandibular  | * Lymph Node, Mediastinal   | * Lymph Node, Mesenteric |
| * Pancreas                 | * Parathyroid Gland       | * Pituitary Gland           | * Salivary Glands        |
| * Seminal Vesicle          | * Skin                    | * Spleen                    | * Stomach, Forestomach   |
| * Stomach, Glandular       | * Testes                  | * Thymus                    | * Thyroid Gland          |
| * Urinary Bladder          |                           |                             |                          |

MISSING

- \* Mammary Gland

OBSERVATIONS

- |                   |                             |              |                         |
|-------------------|-----------------------------|--------------|-------------------------|
| * Larynx          | Respirat Epith              | Metaplasia   | Squamous, Marked        |
| * Lung            | Bronchus, Epithelium        | Hyperplasia  | Mild                    |
|                   | Bronchiole, Epithelium      | Hyperplasia  | Mild                    |
|                   | [ Inflammation TGLs = 1-4 ] | Inflammation | Eosinophil, Mild        |
| * Nose            | Turbinate                   | Atrophy      | Mild                    |
|                   | Respirat Epith              | Hyperplasia  | Moderate                |
|                   | Lymphoid Tiss               | Hyperplasia  | Mild                    |
|                   |                             | Inflammation | Suppurative, Marked     |
|                   | Respirat Epith              | Metaplasia   | Squamous, Marked        |
|                   | Olfactory Epi               | Metaplasia   | Respiratory, Mild       |
|                   | Olfactory Epi               | Necrosis     | Moderate                |
|                   | Respirat Epith              | Necrosis     | Mild                    |
|                   | Respirat Epith              | Regeneration | Minimal                 |
| * Preputial Gland |                             | Inflammation | Chronic Active, Minimal |
| * Prostate        |                             | Inflammation | Chronic Active, Minimal |
| * Trachea         | Epithelium                  | Necrosis     | Mild                    |

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1003

**TRT#:** 11

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 100 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57886

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**ORGAN AND ACCOUNTABLE SITE STATUS**

---

Epithelium

Regeneration

Minimal

---

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1004

TRT#: 11

SEX: Male

DAY ON TEST: 92

DOSE: 100 ppm

DISP: Natural Death

HISTO: 57887

ORGAN AND ACCOUNTABLE SITE STATUS

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Brain	* Epididymis	* Esophagus	* Harderian Gland
* Heart	* Islets, Pancreatic	* Kidney	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mediastinal	* Pancreas	* Pituitary Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Stomach, Forestomach
* Testes	* Thyroid Gland	* Urinary Bladder	

**MISSING**

* Mammary Gland	* Parathyroid Gland	* Preputial Gland
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**AUTO PRECLUDES DIAG.**

* Bone Marrow	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Stomach, Glandular

**OBSERVATIONS**

* Eye	Cornea	Inflammation	Acute, Mild
	Cornea	Neovascularization	Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Metaplasia	Squamous, Marked
* Lung		Inflammation	Acute, Marked
* Lymph Node, Mandibular		Atrophy	Lymphoid, Marked
* Lymph Node, Mesenteric		Atrophy	Lymphoid, Moderate
* Nose	Turbinate	Atrophy	Moderate
	Respirat Epith	Hyperplasia	Minimal
		Inflammation	Suppurative, Mild
	Respirat Epith	Metaplasia	Squamous, Mild
	Olfactory Epi	Metaplasia	Respiratory, Minimal
	Respirat Epith	Necrosis	Minimal
	Olfactory Epi	Necrosis	Minimal
	Septum	Necrosis	Minimal
	Respirat Epith	Regeneration	Mild
* Prostate		Inflammation	Chronic Active, Minimal

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1004

**TRT#:** 11

**SEX:** Male

**DAY ON TEST:** 92

**DOSE:** 100 ppm

**DISP:** Natural Death

**HISTO:** 57887

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**ORGAN AND ACCOUNTABLE SITE STATUS**

---

* Spleen		Atrophy	Lymphoid, Moderate
* Thymus		Atrophy	Lymphoid, Marked
* Trachea	Epithelium	Hyperplasia	Mild
	Epithelium	Necrosis	Marked

---

**PRIMARY CAUSE OF DEATH** - Lung Inflammation

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1005

TRT#: 11

SEX: Male

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57888

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Spleen	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thymus	* Thyroid Gland	* Urinary Bladder	

MISSING

\* Mammary Gland

OBSERVATIONS

* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Metaplasia	Squamous, Moderate
* Lung	Bronchus, Epithelium	Hyperplasia	Atypical, Mild
		Infiltration Cellular	Histiocyte, Minimal
	Bronchus, Epithelium	Necrosis	Minimal
	Bronchus, Epithelium	Regeneration	Minimal
* Nose	Turbinate	Atrophy	Minimal
	Respirat Epith	Hyperplasia	Moderate
	Lymphoid Tiss	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Marked
	Olfactory Epi	Metaplasia	Respiratory, Mild
	Olfactory Epi	Necrosis	Mild
	Respirat Epith	Necrosis	Mild
	Respirat Epith	Regeneration	Minimal
* Trachea	Epithelium	Necrosis	Moderate
	Epithelium	Regeneration	Minimal

\* PROTOCOL REQUIRED TISSUE

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1006

TRT#: 11

SEX: Male

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57889

ORGAN AND ACCOUNTABLE SITE STATUS

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Liver	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Pancreas	* Pituitary Gland
* Salivary Glands	* Seminal Vesicle	* Skin	* Spleen
* Stomach, Forestomach	* Stomach, Glandular	* Testes	* Thymus
* Thyroid Gland	* Urinary Bladder		

**MISSING**

* Lymph Node, Bronchial	* Mammary Gland	* Parathyroid Gland
-------------------------	-----------------	---------------------

**OBSERVATIONS**

* Heart		Cardiomyopathy	Minimal
* Larynx	Respirat Epith	Hyperplasia	Mild
	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
* Lung	Respirat Epith	Metaplasia	Squamous, Moderate
	Bronchus, Epithelium	Hyperplasia	Mild
	Bronchiole, Epithelium	Hyperplasia	Minimal
		Infiltration Cellular	Histiocyte, Mild
		Inflammation	Eosinophil, Mild
* Nose	Turbinate	Atrophy	Mild
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Mild
	Respirat Epith	Metaplasia	Squamous, Moderate
	Olfactory Epi	Necrosis	Mild
	Respirat Epith	Necrosis	Mild
	Respirat Epith	Regeneration	Mild
* Preputial Gland		Inflammation	Chronic Active, Minimal

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1006

**TRT#:** 11

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 100 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57889

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**ORGAN AND ACCOUNTABLE SITE STATUS**

---

\* Prostate

Inflammation

Chronic Active, Minimal

\* Trachea

Epithelium

Necrosis

Moderate

Epithelium

Regeneration

Minimal

---

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1007

TRT#: 11

SEX: Male

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57890

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Preputial Gland
* Prostate	* Salivary Glands	* Seminal Vesicle	* Skin
* Spleen	* Stomach, Forestomach	* Stomach, Glandular	* Testes
* Thymus	* Thyroid Gland	* Urinary Bladder	

MISSING

\* Mammary Gland

OBSERVATIONS

* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Metaplasia	Squamous, Moderate
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Mild
		Infiltration Cellular	Histiocyte, Mild
		Inflammation	Eosinophil, Moderate
	Bronchus, Epithelium	Necrosis	Mild
	Bronchus, Epithelium	Regeneration	Mild
	[ Inflammation TGLs = 1-15 ]		
* Nose	Turbinate	Atrophy	Moderate
	Respirat Epith	Hyperplasia	Moderate
	Lymphoid Tiss	Hyperplasia	Mild
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Olfactory Epi	Necrosis	Minimal
	Respirat Epith	Necrosis	Mild

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1007

**TRT#:** 11

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 100 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57890

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**ORGAN AND ACCOUNTABLE SITE STATUS**

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* Trachea	Respirat Epith	Regeneration	Minimal
	Epithelium	Hyperplasia	Minimal
	Epithelium	Necrosis	Moderate
	Epithelium	Regeneration	Mild

---

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

P14: INDIVIDUAL PATHOLOGY DATA  
 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

ANIMAL ID: 1008

TRT#: 11

SEX: Male

DAY ON TEST: 91

DOSE: 100 ppm

DISP: Natural Death

HISTO: 57891

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Harderian Gland	* Heart	* Intestine Small, Duodenum	* Islets, Pancreatic
* Kidney	* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Spleen	* Stomach, Forestomach
* Testes	* Thymus	* Thyroid Gland	* Urinary Bladder

AUTO PRECLUDES DIAG.

* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Stomach, Glandular		

OBSERVATIONS

* Eye	Cornea	Inflammation	Acute, Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Metaplasia	Squamous, Moderate
* Lung		Congestion	Mild
		Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Eosinophil, Minimal
	Bronchus, Epithelium	Necrosis	Marked
	Bronchus, Epithelium	Regeneration	Moderate
	[ Congestion TGLs = 1-4+5 ]		
* Nose	Turbinate	Atrophy	Moderate
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Marked
	Olfactory Epi	Necrosis	Moderate
	Respirat Epith	Necrosis	Moderate
	Respirat Epith	Regeneration	Minimal
* Prostate		Inflammation	Chronic Active, Moderate
* Trachea		Inflammation	Chronic Active, Mild
	Epithelium	Metaplasia	Squamous, Mild

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 1008

**TRT#:** 11

**SEX:** Male

**DAY ON TEST:** 91

**DOSE:** 100 ppm

**DISP:** Natural Death

**HISTO:** 57891

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

Epithelium

Necrosis

Marked

Epithelium

Regeneration

Mild

---

**PRIMARY CAUSE OF DEATH**

- Nose Inflammation

---

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1009

TRT#: 11

SEX: Male

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57892

ORGAN AND ACCOUNTABLE SITE STATUS

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Epididymis	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Pancreas	* Pituitary Gland	* Preputial Gland	* Salivary Glands
* Seminal Vesicle	* Skin	* Spleen	* Stomach, Forestomach
* Stomach, Glandular	* Testes	* Thymus	* Thyroid Gland
* Urinary Bladder			

**MISSING**

* Mammary Gland	* Parathyroid Gland
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**OBSERVATIONS**

* Larynx	Respirat Epith	Metaplasia	Squamous, Marked
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Atypical, Mild
		Infiltration Cellular	Histiocyte, Mild
		Inflammation	Eosinophil, Mild
	Bronchus, Epithelium	Necrosis	Mild
	Bronchus, Epithelium	Regeneration	Mild
* Nose	Turbinate	Atrophy	Mild
	Respirat Epith	Hyperplasia	Moderate
	Lymphoid Tiss	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Marked
	Olfactory Epi	Metaplasia	Respiratory, Mild
	Respirat Epith	Necrosis	Mild
	Respirat Epith	Regeneration	Minimal
* Prostate		Inflammation	Chronic Active, Minimal
* Trachea	Epithelium	Metaplasia	Squamous, Minimal

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1009

**TRT#:** 11

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 100 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57892

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**ORGAN AND ACCOUNTABLE SITE STATUS**

---

Epithelium

Necrosis

Marked

Epithelium

Regeneration

Mild

---

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1010

TRT#: 11

SEX: Male

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57893

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

- |                            |                           |                             |                          |
|----------------------------|---------------------------|-----------------------------|--------------------------|
| * Adrenal Cortex           | * Adrenal Medulla         | Blood Vessel                | * Bone                   |
| * Bone Marrow              | * Brain                   | * Epididymis                | * Esophagus              |
| * Eye                      | * Harderian Gland         | * Heart                     | * Intestine Large, Cecum |
| * Intestine Large, Colon   | * Intestine Large, Rectum | * Intestine Small, Duodenum | * Intestine Small, Ileum |
| * Intestine Small, Jejunum | * Islets, Pancreatic      | * Kidney                    | * Liver                  |
| * Lymph Node, Bronchial    | * Lymph Node, Mandibular  | * Lymph Node, Mediastinal   | * Lymph Node, Mesenteric |
| * Parathyroid Gland        | * Pituitary Gland         | * Preputial Gland           | * Prostate               |
| * Salivary Glands          | * Seminal Vesicle         | * Skin                      | * Spleen                 |
| * Stomach, Forestomach     | * Stomach, Glandular      | * Testes                    | * Thymus                 |
| * Thyroid Gland            | * Urinary Bladder         |                             |                          |

MISSING

- \* Mammary Gland

OBSERVATIONS

- |            |                              |                  |                       |
|------------|------------------------------|------------------|-----------------------|
| * Larynx   | Respirat Epith               | Metaplasia       | Squamous, Moderate    |
| * Lung     | Bronchiole, Epithelium       | Hyperplasia      | Minimal               |
|            | [ Inflammation TGLs = 1-15 ] | Inflammation     | Eosinophil, Mild      |
| * Nose     | Turbinate                    | Atrophy          | Mild                  |
|            | Olfactory Epi                | Atrophy          | Mild                  |
|            | Respirat Epith               | Hyperplasia      | Moderate              |
|            | Lymphoid Tiss                | Hyperplasia      | Mild                  |
|            |                              | Inflammation     | Suppurative, Marked   |
|            | Respirat Epith               | Metaplasia       | Squamous, Moderate    |
|            | Olfactory Epi                | Metaplasia       | Respiratory, Moderate |
|            | Olfactory Epi                | Necrosis         | Moderate              |
|            | Respirat Epith               | Necrosis         | Moderate              |
|            | Respirat Epith               | Regeneration     | Minimal               |
| * Pancreas |                              | Basophilic Focus |                       |
| * Trachea  | Epithelium                   | Metaplasia       | Squamous, Minimal     |
|            | Epithelium                   | Necrosis         | Marked                |

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1010

**TRT#:** 11

**SEX:** Male

**DAY ON TEST:** 93

**DOSE:** 100 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57893

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**ORGAN AND ACCOUNTABLE SITE STATUS**

---

Epithelium

Regeneration

Minimal

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

**ANIMAL ID:** 101

**TRT#:** 2

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** CONTROL

**DISP:** Terminal Sacrifice

**HISTO:** 57874

**ORGAN AND ACCOUNTABLE SITE STATUS**

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Ovary	* Pancreas
* Parathyroid Gland	* Salivary Glands	* Skin	* Spleen
* Stomach, Forestomach	* Stomach, Glandular	* Thymus	* Thyroid Gland
* Trachea	* Urinary Bladder	* Uterus	

**OBSERVATIONS**

* Clitoral Gland		Inflammation	Chronic Active, Mild
* Lung		Inflammation	Eosinophil, Minimal
* Pituitary Gland	Pars Distalis	Cyst	

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

**ANIMAL ID:** 102

**TRT#:** 2

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** CONTROL

**DISP:** Terminal Sacrifice

**HISTO:** 57875

**ORGAN AND ACCOUNTABLE SITE STATUS**

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Liver
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Ovary
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Salivary Glands
* Skin	* Spleen	* Stomach, Forestomach	* Stomach, Glandular
* Thymus	* Thyroid Gland	* Trachea	* Urinary Bladder
* Uterus			

**OBSERVATIONS**

\* Clitoral Gland

Inflammation

Chronic Active, Minimal

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 103

**TRT#:** 2

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** CONTROL

**DISP:** Terminal Sacrifice

**HISTO:** 57876

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**ORGAN AND ACCOUNTABLE SITE STATUS**

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**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Salivary Glands	* Skin	* Spleen	* Stomach, Forestomach
* Stomach, Glandular	* Thymus	* Thyroid Gland	* Trachea
* Urinary Bladder	* Uterus		

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

**ANIMAL ID:** 104

**TRT#:** 2

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** CONTROL

**DISP:** Terminal Sacrifice

**HISTO:** 57877

**ORGAN AND ACCOUNTABLE SITE STATUS**

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Salivary Glands	* Skin	* Spleen	* Stomach, Forestomach
* Stomach, Glandular	* Thymus	* Thyroid Gland	* Trachea
* Urinary Bladder	* Uterus		

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

**ANIMAL ID:** 105

**TRT#:** 2

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** CONTROL

**DISP:** Terminal Sacrifice

**HISTO:** 57878

**ORGAN AND ACCOUNTABLE SITE STATUS**

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Larynx	* Liver	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Nose	* Ovary	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Salivary Glands	* Skin	* Spleen
* Stomach, Forestomach	* Stomach, Glandular	* Thymus	* Thyroid Gland
* Trachea	* Urinary Bladder	* Uterus	

**OBSERVATIONS**

* Clitoral Gland	Inflammation	Chronic Active, Mild
* Kidney	Nephropathy	Minimal
* Lung	Inflammation	Eosinophil, Minimal

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

**ANIMAL ID:** 106

**TRT#:** 2

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** CONTROL

**DISP:** Terminal Sacrifice

**HISTO:** 57879

**ORGAN AND ACCOUNTABLE SITE STATUS**

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Salivary Glands	* Skin	* Spleen	* Stomach, Forestomach
* Stomach, Glandular	* Thymus	* Thyroid Gland	* Trachea
* Urinary Bladder	* Uterus		

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 107

TRT#: 2

SEX: Female

DAY ON TEST: 93

DOSE: CONTROL

DISP: Terminal Sacrifice

HISTO: 57880

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Ovary
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Salivary Glands
* Skin	* Spleen	* Stomach, Forestomach	* Stomach, Glandular
* Thymus	* Thyroid Gland	* Trachea	* Urinary Bladder
* Uterus			

OBSERVATIONS

* Lung	Inflammation	Eosinophil, Minimal
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**Experiment Number:** 20725 - 01  
**Test Type:** 90-DAY  
**Route:** RESPIRATORY EXPOSURE WHOLE BODY  
**Species/Strain:** RATS/Wistar Han

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

**ANIMAL ID:** 108

**TRT#:** 2

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** CONTROL

**DISP:** Terminal Sacrifice

**HISTO:** 57881

**ORGAN AND ACCOUNTABLE SITE STATUS**

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Larynx	* Lung
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Nose	* Ovary	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Salivary Glands	* Skin
* Spleen	* Stomach, Forestomach	* Stomach, Glandular	* Thymus
* Thyroid Gland	* Trachea	* Urinary Bladder	* Uterus

**OBSERVATIONS**

* Harderian Gland	Inflammation	Chronic Active, Minimal
* Liver	Inflammation	Chronic Active, Minimal

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

**ANIMAL ID:** 109

**TRT#:** 2

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** CONTROL

**DISP:** Terminal Sacrifice

**HISTO:** 57882

**ORGAN AND ACCOUNTABLE SITE STATUS**

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Nose
* Ovary	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Salivary Glands	* Skin	* Spleen	* Stomach, Forestomach
* Stomach, Glandular	* Thymus	* Thyroid Gland	* Trachea
* Urinary Bladder	* Uterus		

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 110

TRT#: 2

SEX: Female

DAY ON TEST: 93

DOSE: CONTROL

DISP: Terminal Sacrifice

HISTO: 57883

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Larynx
* Liver	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Nose	* Ovary
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Salivary Glands
* Skin	* Spleen	* Stomach, Forestomach	* Stomach, Glandular
* Thymus	* Thyroid Gland	* Trachea	* Urinary Bladder
* Uterus			

OBSERVATIONS

* Lung	Inflammation	Eosinophil, Minimal
--------	--------------	---------------------

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 301

**TRT#:** 4

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57974

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 302

**TRT#:** 4

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57975

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 303

**TRT#:** 4

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57976

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 304

**TRT#:** 4

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57977

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Nose

Trachea

---

**OBSERVATIONS**

Lung

Inflammation

Eosinophil, Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 305

**TRT#:** 4

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57978

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 306

**TRT#:** 4

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57979

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Trachea

---

**OBSERVATIONS**

Nose

Lymphoid Tiss

Hyperplasia

Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 307

**TRT#:** 4

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57980

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 308

**TRT#:** 4

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57981

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Nose

Trachea

---

**OBSERVATIONS**

Lung

Inflammation

Eosinophil, Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 309

**TRT#:** 4

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57982

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Nose

Trachea

---

**OBSERVATIONS**

Lung

Inflammation

Eosinophil, Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 310

**TRT#:** 4

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 6.25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57983

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Nose

Trachea

---

**OBSERVATIONS**

Lung

Alveolar Epith

Inflammation

Acute, Focal, Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 501

**TRT#:** 6

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57954

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 502

**TRT#:** 6

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57955

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 503

**TRT#:** 6

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57956

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 504

**TRT#:** 6

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57957

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 505

**TRT#:** 6

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57958

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 506

**TRT#:** 6

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57959

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 507

**TRT#:** 6

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57960

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 508

**TRT#:** 6

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57961

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 509

**TRT#:** 6

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57962

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 510

**TRT#:** 6

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 12.5 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57963

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 701

**TRT#:** 8

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57934

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Trachea

---

**OBSERVATIONS**

\* Nose

Lymphoid Tiss

Hyperplasia

Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 702

**TRT#:** 8

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57935

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Trachea

---

**OBSERVATIONS**

\* Nose

Lymphoid Tiss

Hyperplasia

Minimal

Respirat Epith

Metaplasia

Squamous, Minimal

---

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 703

TRT#: 8

SEX: Female

DAY ON TEST: 93

DOSE: 25 ppm

DISP: Terminal Sacrifice

HISTO: 57936

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Larynx

Lung

Lymph Node, Mandibular

Trachea

OBSERVATIONS

\* Nose

Olfactory Epi

Degeneration

Minimal

Respirat Epith

Metaplasia

Squamous, Minimal

Thymus

Hemorrhage

Mild

[ Hemorrhage TGLs = 2-3 ]

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 704

**TRT#:** 8

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57937

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Trachea

---

**OBSERVATIONS**

\* Nose

Respirat Epith

Metaplasia

Squamous, Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 705

**TRT#:** 8

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57938

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 706

**TRT#:** 8

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57939

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Trachea

---

**OBSERVATIONS**

\* Nose

Olfactory Epi

Degeneration

Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 707

**TRT#:** 8

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57940

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

\* Nose

Trachea

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 708

**TRT#:** 8

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57941

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Trachea

---

**OBSERVATIONS**

\* Nose

Respirat Epith

Metaplasia

Squamous, Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

---

**ANIMAL ID:** 709

**TRT#:** 8

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57942

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Trachea

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**OBSERVATIONS**

Lung

Inflammation

Eosinophil, Minimal

[ Inflammation TGLs = 1-4+5 ]

\* Nose

Olfactory Epi

Degeneration

Minimal

Respirat Epith

Metaplasia

Squamous, Minimal

---

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 710

**TRT#:** 8

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 25 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57943

---

**ORGAN AND ACCOUNTABLE SITE STATUS**

---

**NORMAL**

Larynx

Lung

Trachea

---

**OBSERVATIONS**

\* Nose

Olfactory Epi

Degeneration

Minimal

---

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 901

TRT#: 10

SEX: Female

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57914

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Eye

OBSERVATIONS

* Larynx	Respirat Epith	Metaplasia	Squamous, Minimal
* Lung		Inflammation	Eosinophil, Minimal
* Nose	Turbinate	Atrophy	Mild
	Olfactory Epi	Degeneration	Minimal
	Respirat Epith	Hyperplasia	Mild
	Lymphoid Tiss	Hyperplasia	Mild
		Inflammation	Suppurative, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Respirat Epith	Metaplasia	Squamous, Mild
* Trachea	Epithelium	Necrosis	Mild
	Epithelium	Regeneration	Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 902

TRT#: 10

SEX: Female

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57915

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Eye

\* Lung

\* Trachea

OBSERVATIONS

\* Larynx

Respirat Epith

Metaplasia

Squamous, Minimal

\* Nose

Turbinate

Atrophy

Minimal

Olfactory Epi

Degeneration

Minimal

Respirat Epith

Hyperplasia

Moderate

Inflammation

Suppurative, Minimal

Olfactory Epi

Metaplasia

Respiratory, Minimal

Respirat Epith

Metaplasia

Squamous, Moderate

Respirat Epith

Necrosis

Minimal

Respirat Epith

Regeneration

Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 903

TRT#: 10

SEX: Female

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57916

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Eye

\* Larynx

\* Lung

\* Trachea

OBSERVATIONS

\* Nose

Respirat Epith

Hyperplasia

Minimal

Lymphoid Tiss

Hyperplasia

Minimal

Inflammation

Suppurative, Minimal

Olfactory Epi

Metaplasia

Respiratory, Minimal

Respirat Epith

Metaplasia

Squamous, Mild

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 904

TRT#: 10

SEX: Female

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57917

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Eye

\* Larynx

\* Lung

\* Trachea

OBSERVATIONS

\* Nose

Olfactory Epi  
Respirat Epith  
Lymphoid Tiss

Degeneration  
Hyperplasia  
Hyperplasia  
Inflammation

Minimal  
Moderate  
Mild  
Suppurative, Minimal  
Respiratory, Mild  
Squamous, Moderate

Olfactory Epi  
Respirat Epith

Metaplasia  
Metaplasia

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 905

TRT#: 10

SEX: Female

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57918

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Eye

\* Lung

\* Trachea

OBSERVATIONS

\* Larynx

Respirat Epith

Metaplasia

Squamous, Minimal

\* Nose

Olfactory Epi

Degeneration

Minimal

Respirat Epith

Hyperplasia

Moderate

Lymphoid Tiss

Hyperplasia

Moderate

Inflammation

Suppurative, Mild

Olfactory Epi

Metaplasia

Respiratory, Minimal

Respirat Epith

Metaplasia

Squamous, Moderate

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 906

TRT#: 10

SEX: Female

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57919

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

\* Lung

\* Trachea

OBSERVATIONS

Eye	Cornea	Inflammation	Acute, Mild
* Larynx	Respirat Epith	Metaplasia	Squamous, Minimal
* Nose	Turbinate	Atrophy	Minimal
	Olfactory Epi	Degeneration	Minimal
	Respirat Epith	Hyperplasia	Mild
	Lymphoid Tiss	Hyperplasia	Minimal
		Inflammation	Suppurative, Mild
	Olfactory Epi	Metaplasia	Respiratory, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
	Respirat Epith	Regeneration	Minimal

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
 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

**ANIMAL ID:** 907

**TRT#:** 10

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 50 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57920

**ORGAN AND ACCOUNTABLE SITE STATUS**

**NORMAL**

Eye

\* Lung

\* Trachea

**OBSERVATIONS**

Clitoral Gland

Inflammation

Chronic Active, Moderate

[ Inflammation TGLs = 1-14 ]

\* Larynx

Respirat Epith

Metaplasia

Squamous, Minimal

\* Nose

Turbinate

Atrophy

Minimal

Olfactory Epi

Degeneration

Minimal

Respirat Epith

Hyperplasia

Moderate

Lymphoid Tiss

Hyperplasia

Minimal

Inflammation

Suppurative, Moderate

Olfactory Epi

Metaplasia

Respiratory, Minimal

Respirat Epith

Metaplasia

Squamous, Moderate

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 908

TRT#: 10

SEX: Female

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57921

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Eye

\* Lung

\* Trachea

OBSERVATIONS

\* Larynx

Respirat Epith

Metaplasia

Squamous, Minimal

\* Nose

Olfactory Epi

Degeneration

Minimal

Respirat Epith

Hyperplasia

Moderate

Lymphoid Tiss

Hyperplasia

Mild

Inflammation

Suppurative, Mild

Olfactory Epi

Metaplasia

Respiratory, Mild

Respirat Epith

Metaplasia

Squamous, Moderate

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 909

TRT#: 10

SEX: Female

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57922

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Eye

\* Lung

OBSERVATIONS

\* Larynx

Respirat Epith

Metaplasia

Squamous, Minimal

\* Nose

Olfactory Epi

Degeneration

Minimal

Respirat Epith

Hyperplasia

Moderate

Lymphoid Tiss

Hyperplasia

Mild

Inflammation

Suppurative, Mild

Olfactory Epi

Metaplasia

Respiratory, Minimal

Respirat Epith

Metaplasia

Squamous, Moderate

Respirat Epith

Necrosis

Minimal

\* Trachea

Epithelium

Regeneration

Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
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

ANIMAL ID: 910

TRT#: 10

SEX: Female

DAY ON TEST: 93

DOSE: 50 ppm

DISP: Terminal Sacrifice

HISTO: 57923

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

Eye

\* Lung

\* Trachea

OBSERVATIONS

\* Larynx

Respirat Epith

Metaplasia

Squamous, Minimal

\* Nose

Olfactory Epi

Degeneration

Minimal

Respirat Epith

Hyperplasia

Moderate

Inflammation

Suppurative, Mild

Olfactory Epi

Metaplasia

Respiratory, Minimal

Respirat Epith

Metaplasia

Squamous, Moderate

Respirat Epith

Necrosis

Minimal

Respirat Epith

Regeneration

Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1101

TRT#: 12

SEX: Female

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57894

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Liver	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Ovary	* Pancreas	* Parathyroid Gland	* Pituitary Gland
* Salivary Glands	* Skin	* Spleen	* Stomach, Forestomach
* Stomach, Glandular	* Thymus	* Thyroid Gland	* Urinary Bladder
* Uterus			

OBSERVATIONS

* Eye	Cornea	Inflammation	Acute, Mild
	Cornea	Neovascularization	Minimal
	Cornea, Epithelium	Vacuolation	Minimal
	[ Inflammation TGLs = 1-13 ]		
* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Metaplasia	Squamous, Moderate
	Epithelium	Necrosis	Minimal
* Lung	Bronchus, Epithelium	Hyperplasia	Atypical, Mild
		Inflammation	Eosinophil, Mild
	Bronchus, Epithelium	Necrosis	Mild
	Bronchus, Epithelium	Regeneration	Moderate
	[ Inflammation TGLs = 3-4 ]		
Lymph Node	Deep Cervical	Hyperplasia	Lymphoid, Minimal
	[ Hyperplasia TGLs = 2-14 ]		
* Nose	Turbinate	Atrophy	Mild
	Olfactory Epi	Atrophy	Minimal
	Olfactory Epi	Degeneration	Minimal
	Respirat Epith	Hyperplasia	Moderate
	Lymphoid Tiss	Hyperplasia	Minimal

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1101

**TRT#:** 12

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 100 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57894

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**ORGAN AND ACCOUNTABLE SITE STATUS**

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		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Olfactory Epi	Necrosis	Minimal
	Respirat Epith	Necrosis	Mild
	Respirat Epith	Regeneration	Mild
* Trachea	Epithelium	Necrosis	Mild
	Epithelium	Regeneration	Minimal

---

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1102

TRT#: 12

SEX: Female

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57895

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mesenteric	* Mammary Gland	* Ovary
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Salivary Glands
* Skin	* Spleen	* Stomach, Forestomach	* Stomach, Glandular
* Thymus	* Thyroid Gland	* Urinary Bladder	* Uterus

MISSING

* Lymph Node, Mandibular	* Lymph Node, Mediastinal
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OBSERVATIONS

* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Metaplasia	Squamous, Moderate
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Atypical, Mild
	Bronchus, Epithelium	Regeneration	Minimal
* Nose	Turbinate	Atrophy	Mild
	Respirat Epith	Hyperplasia	Moderate
	Lymphoid Tiss	Hyperplasia	Mild
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Olfactory Epi	Necrosis	Minimal
	Respirat Epith	Necrosis	Mild
	Respirat Epith	Regeneration	Mild
* Trachea	Epithelium	Hyperplasia	Mild
	Epithelium	Necrosis	Moderate
	Epithelium	Regeneration	Minimal

\* PROTOCOL REQUIRED TISSUE

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

P14: INDIVIDUAL ANATOMY PATHOLOGY DATA  
 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

ANIMAL ID: 1103

TRT#: 12

SEX: Female

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57896

ORGAN AND ACCOUNTABLE SITE STATUS

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Esophagus	* Eye
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Liver	* Lymph Node, Mandibular
* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland	* Ovary
* Pancreas	* Pituitary Gland	* Salivary Glands	* Skin
* Spleen	* Stomach, Forestomach	* Stomach, Glandular	* Thymus
* Thyroid Gland	* Urinary Bladder	* Uterus	

**MISSING**

* Lymph Node, Bronchial	* Parathyroid Gland
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**OBSERVATIONS**

* Clitoral Gland		Inflammation	Chronic Active, Minimal
* Larynx		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
	Epithelium	Necrosis	Mild
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Mild
		Inflammation	Eosinophil, Mild
	[ Inflammation TGLs = 1-4 ]		
* Nose	Turbinate	Atrophy	Minimal
	Respirat Epith	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate
	Olfactory Epi	Necrosis	Minimal
	Respirat Epith	Necrosis	Mild
	Respirat Epith	Regeneration	Mild
* Trachea	Epithelium	Hyperplasia	Moderate
	Epithelium	Necrosis	Mild

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1103

**TRT#:** 12

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 100 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57896

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**ORGAN AND ACCOUNTABLE SITE STATUS**

---

Epithelium

Regeneration

Mild

---

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1104

TRT#: 12

SEX: Female

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57897

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Ovary	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder	* Uterus

OBSERVATIONS

* Larynx	Squam Epithel Respirat Epith	Hyperplasia Metaplasia	Mild Squamous, Moderate
* Lung	Bronchiole, Epithelium Bronchus, Epithelium	Foreign Body Hyperplasia Hyperplasia Inflammation	Minimal Mild Eosinophil, Mild
[ Inflammation TGLs = 1-14 ]			
* Nose	Turbinate Olfactory Epi Respirat Epith Lymphoid Tiss  Respirat Epith Olfactory Epi Respirat Epith Respirat Epith	Atrophy Atrophy Hyperplasia Hyperplasia Inflammation Metaplasia Metaplasia Necrosis Regeneration	Mild Mild Moderate Moderate Suppurative, Marked Squamous, Moderate Respiratory, Mild Mild Minimal
* Spleen		Atrophy	Lymphoid, Moderate
* Thymus		Atrophy	Lymphoid, Mild
* Trachea	Epithelium Epithelium	Hyperplasia Necrosis	Moderate Mild

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1104

**TRT#:** 12

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 100 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57897

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**ORGAN AND ACCOUNTABLE SITE STATUS**

---

Epithelium

Regeneration

Minimal

---

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1105

TRT#: 12

SEX: Female

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57898

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Harderian Gland	* Heart	* Intestine Large, Cecum	* Intestine Large, Colon
* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum
* Islets, Pancreatic	* Kidney	* Liver	* Lymph Node, Bronchial
* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric	* Mammary Gland
* Pancreas	* Parathyroid Gland	* Pituitary Gland	* Salivary Glands
* Skin	* Spleen	* Stomach, Forestomach	* Stomach, Glandular
* Thymus	* Thyroid Gland	* Urinary Bladder	* Uterus

OBSERVATIONS

* Eye	Cornea	Inflammation	Acute, Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
	Epithelium	Necrosis	Mild
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Minimal
		Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Eosinophil, Mild
	[ Inflammation TGLs = 2,3-14+15 ]		
* Nose	Turbinate	Atrophy	Minimal
	Respirat Epith	Hyperplasia	Moderate
	Lymphoid Tiss	Hyperplasia	Mild
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Marked
	Olfactory Epi	Metaplasia	Respiratory, Mild
	Olfactory Epi	Necrosis	Minimal
	Respirat Epith	Necrosis	Moderate
	Respirat Epith	Regeneration	Minimal

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1105

**TRT#:** 12

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 100 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57898

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**ORGAN AND ACCOUNTABLE SITE STATUS**

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* Ovary		Cyst	Mild
[ Cyst TGLs = 1-9 ]			
* Trachea	Epithelium	Hyperplasia	Moderate
	Epithelium	Necrosis	Marked
	Epithelium	Regeneration	Minimal

---

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1106

TRT#: 12

SEX: Female

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57899

ORGAN AND ACCOUNTABLE SITE STATUS

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Esophagus	* Harderian Gland
* Heart	* Intestine Large, Cecum	* Intestine Large, Colon	* Intestine Large, Rectum
* Intestine Small, Duodenum	* Intestine Small, Ileum	* Intestine Small, Jejunum	* Islets, Pancreatic
* Kidney	* Liver	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Ovary	* Pancreas
* Pituitary Gland	* Salivary Glands	* Skin	* Stomach, Forestomach
* Stomach, Glandular	* Thyroid Gland	* Urinary Bladder	* Uterus

**MISSING**

* Lymph Node, Bronchial	* Parathyroid Gland	* Thymus
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**OBSERVATIONS**

* Clitoral Gland		Inflammation	Chronic Active, Moderate
* Eye	Cornea	Inflammation	Acute, Minimal
* Larynx	Squam Epithel	Hyperplasia	Mild
		Inflammation	Chronic Active, Minimal
* Lung	Respirat Epith	Metaplasia	Squamous, Moderate
		Foreign Body	
	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Mild
		Inflammation	Acute, Moderate
* Nose	Turbinate	Atrophy	Moderate
	Olfactory Epi	Atrophy	Mild
	Respirat Epith	Hyperplasia	Mild
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Mild
	Respirat Epith	Necrosis	Mild
	Respirat Epith	Regeneration	Minimal
* Spleen		Atrophy	Lymphoid, Moderate
* Trachea	Epithelium	Hyperplasia	Moderate

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1106

**TRT#:** 12

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 100 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57899

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**ORGAN AND ACCOUNTABLE SITE STATUS**

---

Epithelium

Necrosis

Marked

Epithelium

Regeneration

Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1107

TRT#: 12

SEX: Female

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57900

ORGAN AND ACCOUNTABLE SITE STATUS

**NORMAL**

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Ovary	* Pancreas	* Pituitary Gland
* Salivary Glands	* Skin	* Spleen	* Stomach, Forestomach
* Stomach, Glandular	* Thymus	* Thyroid Gland	* Urinary Bladder
* Uterus			

**MISSING**

\* Parathyroid Gland

**OBSERVATIONS**

* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Hyperplasia	Minimal
	Respirat Epith	Metaplasia	Squamous, Moderate
	Epithelium	Necrosis	Mild
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Atypical, Mild
		Inflammation	Eosinophil, Mild
	Bronchus, Epithelium	Metaplasia	Squamous, Mild
	Bronchus, Epithelium	Necrosis	Mild
	Bronchus, Epithelium	Regeneration	Mild
* Nose	Turbinate	Atrophy	Mild
	Olfactory Epi	Atrophy	Minimal
	Respirat Epith	Hyperplasia	Moderate
	Lymphoid Tiss	Hyperplasia	Moderate
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Marked
	Olfactory Epi	Metaplasia	Respiratory, Moderate

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1107

**TRT#:** 12

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 100 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57900

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**ORGAN AND ACCOUNTABLE SITE STATUS**

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* Trachea	Respirat Epith	Necrosis	Moderate
	Septum	Necrosis	Mild
	Epithelium	Hyperplasia	Mild
	Epithelium	Necrosis	Marked
	Epithelium	Regeneration	Mild

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1108

TRT#: 12

SEX: Female

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57901

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Ovary	* Pancreas	* Parathyroid Gland
* Salivary Glands	* Skin	* Spleen	* Stomach, Forestomach
* Stomach, Glandular	* Thymus	* Thyroid Gland	* Urinary Bladder
* Uterus			

OBSERVATIONS

* Larynx	Squam Epithel	Hyperplasia	Mild
	Respirat Epith	Metaplasia	Squamous, Moderate
	Epithelium	Necrosis	Mild
* Lung	Bronchiole, Epithelium	Hyperplasia	Minimal
	Bronchus, Epithelium	Hyperplasia	Mild
		Infiltration Cellular	Histiocyte, Minimal
		Inflammation	Eosinophil, Mild
* Nose	[ Inflammation TGLs = 1,2-4 ]		
	Turbinate	Atrophy	Mild
	Olfactory Epi	Degeneration	Mild
	Respirat Epith	Hyperplasia	Moderate
	Lymphoid Tiss	Hyperplasia	Minimal
		Inflammation	Suppurative, Marked
	Respirat Epith	Metaplasia	Squamous, Moderate
	Olfactory Epi	Metaplasia	Respiratory, Mild
	Respirat Epith	Necrosis	Mild
	Respirat Epith	Regeneration	Minimal
* Pituitary Gland	Pars Distalis	Cyst	
* Trachea	Epithelium	Hyperplasia	Moderate

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1108

**TRT#:** 12

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 100 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57901

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**ORGAN AND ACCOUNTABLE SITE STATUS**

---

Epithelium

Necrosis

Mild

Epithelium

Regeneration

Minimal

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1109

TRT#: 12

SEX: Female

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57902

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Liver
* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal	* Lymph Node, Mesenteric
* Mammary Gland	* Ovary	* Pancreas	* Parathyroid Gland
* Pituitary Gland	* Salivary Glands	* Skin	* Spleen
* Stomach, Forestomach	* Stomach, Glandular	* Thymus	* Thyroid Gland
* Urinary Bladder	* Uterus		

OBSERVATIONS

* Larynx	Squam Epithel	Hyperplasia Inflammation	Mild Chronic Active, Minimal
	Respirat Epith Epithelium	Metaplasia Necrosis	Squamous, Moderate Minimal
* Lung	Respirat Epith Bronchiole, Epithelium Bronchus, Epithelium	Regeneration Hyperplasia Hyperplasia Infiltration Cellular Inflammation	Minimal Minimal Atypical, Mild Histocyte, Minimal Eosinophil, Mild Squamous, Mild
* Nose	Bronchus, Epithelium Bronchus, Epithelium Turbinat Olfactory Epi Respirat Epith	Metaplasia Regeneration Atrophy Degeneration Hyperplasia Inflammation	Minimal Minimal Mild Mild Mild Suppurative, Minimal
	Respirat Epith Olfactory Epi Respirat Epith Septum	Metaplasia Metaplasia Necrosis Necrosis	Squamous, Marked Respiratory, Mild Mild Minimal

\* PROTOCOL REQUIRED TISSUE

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

**P14: INDIVIDUAL ANIMAL PATHOLOGY DATA**  
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

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**ANIMAL ID:** 1109

**TRT#:** 12

**SEX:** Female

**DAY ON TEST:** 93

**DOSE:** 100 ppm

**DISP:** Terminal Sacrifice

**HISTO:** 57902

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**ORGAN AND ACCOUNTABLE SITE STATUS**

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* Trachea	Respirat Epith	Regeneration	Minimal
	Epithelium	Hyperplasia	Minimal
	Epithelium	Necrosis	Mild
	Epithelium	Regeneration	Minimal

---

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

P14: INDIVIDUAL ANIMAL PATHOLOGY DATA  
 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

ANIMAL ID: 1110

TRT#: 12

SEX: Female

DAY ON TEST: 93

DOSE: 100 ppm

DISP: Terminal Sacrifice

HISTO: 57903

ORGAN AND ACCOUNTABLE SITE STATUS

NORMAL

* Adrenal Cortex	* Adrenal Medulla	Blood Vessel	* Bone
* Bone Marrow	* Brain	* Clitoral Gland	* Esophagus
* Eye	* Harderian Gland	* Heart	* Intestine Large, Cecum
* Intestine Large, Colon	* Intestine Large, Rectum	* Intestine Small, Duodenum	* Intestine Small, Ileum
* Intestine Small, Jejunum	* Islets, Pancreatic	* Kidney	* Liver
* Lung	* Lymph Node, Bronchial	* Lymph Node, Mandibular	* Lymph Node, Mediastinal
* Lymph Node, Mesenteric	* Mammary Gland	* Ovary	* Pancreas
* Parathyroid Gland	* Pituitary Gland	* Salivary Glands	* Skin
* Spleen	* Stomach, Forestomach	* Stomach, Glandular	* Thymus
* Thyroid Gland	* Urinary Bladder	* Uterus	

OBSERVATIONS

* Larynx	Squam Epithel	Hyperplasia Inflammation	Mild Chronic Active, Minimal
* Nose	Respirat Epith Turbinate Olfactory Epi Respirat Epith	Metaplasia Atrophy Degeneration Hyperplasia Inflammation	Squamous, Moderate Moderate Mild Moderate Suppurative, Moderate
* Trachea	Respirat Epith Olfactory Epi Respirat Epith Respirat Epith Epithelium Epithelium Epithelium	Metaplasia Metaplasia Necrosis Regeneration Hyperplasia Inflammation Necrosis Regeneration	Squamous, Marked Respiratory, Moderate Mild Minimal Mild Chronic Active, Minimal Mild Minimal

\*\*\* END OF REPORT \*\*\*