3M Specialty Materials

3M Center
St. Paul, MN 55144-1000
651 733 1110

62110
AR 226 - 1123

FYI-0902-001378

67pp

September 17, 2002

VIA FEDERAL EXPRESS

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2002 SEP 18 AM 11:02

Document Control Office (DCO)
Office of Pollution Prevention and Toxics (OPPT)
US Environmental Protection Agency
EPA East, Room 6428
1201 Constitution Avenue, NW
Washington, D.C. 20460

FYI-00-001378

Attention: Docket No. AR-226 and the FYI Docket

Re: Information on Perfluorooctane Sulfonates and Related Compounds

Dear Sir or Madam:

This continues 3M's voluntary submissions of data on perfluorooctane sulfonates and related compounds, as part of our ongoing dialogue with EPA regarding fluorochemicals.

On August 30, 2002, a meeting was held between USEPA personnel and the representatives from the Fluoropolymer Manufacturer's Group of the Society of the Plastics Industry to discuss scientific aspects of the results of two toxicology studies pertaining to ammonium perfluorooctanoate that were previously submitted to AR-226. The studies discussed were the six-month oral toxicity study in male cynomolgus monkeys and the multi-generation reproduction/developmental study in rats. At the meeting, a detailed analysis of raw estrous cycling data from the latter study was presented by Dr. John L. Butenhoff, 3M. As an action item from the meeting, it was agreed that the raw data and its analysis would be submitted formally to AR-226 with additional analyses that may be helpful in understanding the results of the study. The intent of this submission is to provide the raw data and analyses, as agreed on August 30, 2002.

2002 OCT -2 AM 8:59

Included in this submission are the following:

- An exact copy of raw estrous cycling data for P and F1 females from Argus Research Protocol 418-020, "Oral (Gavage) Two-Generation (One Litter per Generation) Reproduction Study of Ammonium Perfluorooctanoate (APFO) in Rats".
- A table (two pages) entitled, "Estrous Cycling and Natural Delivery/Litter Observation Data" which, in addition to data on estrous cycling, contains information on mean litter numbers of implantations, liveborn, and stillborn by dose group.
- An analysis of P and F1 generation estrous cycling data made subsequent to the August 30, 2002 meeting and including colored charts which graphically represent the raw estrous cycling data.

85020000012

CONTAIN NO CBI

We will continue to provide information as it becomes available. Please feel free to contact me with any questions.

Very truly yours,

Michael A. Santoro
Director of Environmental, Health
Safety and Regulatory Affairs
Specialty Materials Markets
3M
Building 236-1B-10
St. Paul, Minnesota 55144
651-733-6374 (phone)
651-733-1958 (fax)
E-mail: masantoro@mmm.com

cc: Dr. Charles Auer
Dr. Oscar Hernandez

905 Sheehy Drive, Bldg. A
Horsham, PA 19044
Telephone: (215) 443-8710
Telefax: (215) 443-8587

AR 226_1124

ARGUS RESEARCH
Charles River Laboratories
Discovery and Development Services

September 11, 2002

John Butenhoff, Ph.D., DABT, CIH
3M Corporate Toxicology
3M Medical Department
3M Center, Building 220-2E-02
St. Paul, Minnesota 55144-1000

Telephone: (651) 733-1962
Telefax: (651) 733-1773

RECEIVED
SEP 12 2002

RE: Protocol 418-020 - Oral (Gavage) Two-Generation (One Litter per Generation) Reproduction Study of Ammonium Perfluorooctanoate (APFO) in Rats
Sponsor's Study Number: T-6889.6

Dear Dr. Butenhoff:

Enclosed are the copies of the estrous cycle evaluation for P and F1 generation rats which you requested.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Jo Ann Frazee, M.S.
Study Coordinator

2002 OCT -2 AM 8:59
OPPT NCIC

Enc.

ESTROUS CYCLE EVALUATION

P GENERATION FEMALE RATS

EXACT COPY
9/11/02

002947b

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
0 (Vehicle) MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus
E = Estrus
M = Metestrus
D = Diestrus

DATE	1-1-01	1-2-01	1-3-01	1-4-01	1-5-01	1-6-01	1-7-01	1-8-01	1-9-01	1-10-01	1-11-01	1/12/01	1-13-01	1-14-01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Saline Pre-Check Tech/Time	alc 1123	alc 1126	alc 1133	alc 1120	JTB 1132	JTB 1120	JTB 1124	PA 1122	PA 1133	SCY 1134	PA 1115	SCY 1133	PA 1114	PA 1125
Saline Post-Check Tech/Time	alc 1200	alc 1155	alc 1200	SCY 1156	LAS 1205	JTB 1147	JTB 1150	1200 SCY	1158 SCY	1200 SCY	DN 1213	SCY 1202	PA 1146	PA 1153
Smears Taken Tech/Time Start	alc/MPH/WSC 1130	alc/ALM/SMB/DMD 1131	alc/DMD/ALM/SMB 1134	alc/SMB/ALM/DMD 1128	LAS/JTB/CHL/DMD 1135	DLF/KGL/JTB 1124	JTB/DLF/KGL 1125	MKF/PA/KMC/SCY 1126	PA/SCY/MKF/KMC 1135	PA/SCY/MKF/KMC 1141	MKF/KMC 1140	ALP/CHL/KMC 1136	PA/VHL/CHL/SSC 1120	PA/JSC/CHL 1129
Smears Taken Time End	1158	1152	1158	1151	1202	1146	1149	1157	1155	1159	1211	1200	1145	1152
Smears Read Tech/Time Start	alc/MPH 1201	alc 1155	alc 1200	SCY 1159	LAS 1206	JTB/DLF 1147	JTB/DLF 1150	1201 SCY	1158 SCY	1201 SCY	DN 1214	SCY 1202	PA 1146	PA 1153
Smears Read Time End	1223	1245	1245	~~8~~ 3 1237	LAS 1325	1202	1205	1258	1230	1230	1240	8	1202	1211
Animal Number														
13801	D	D	D	E	M	D	P	E	M	D	P	E	M	D
13802	D	D	E	D	D	E	E	D	E	D	E	D	D	P
13803	M	D	P	E	M	D	P	E	D	D	P	E	D	D
13804	E	E	M	D	5 ~~D~~ P	E	M	D	P	E	M	D	D	E
13805	D	E	M	D	5 ~~D~~ P	E	M	D	E	E	M	D	E	E
13806	E	E	D	D	P	E	D	D	6 ~~E~~ P	~~E~~ 7 D	D	D	E	E
13807	D	D	E	D	D	P	E	D	D	P	E	M	D	P
13808	E	E	D	D	~~D~~ E 4	E	M	D	P	E	D	D	E	E
13809	E	D	D	P	E	D	D	P	E	M	D	P	E	M
13810	P	D	E	D	D	E	E	D	D	P	E	D	D	D
13811	D	E	2 ~~E~~ M	D	D	E	E	M	D	D	E	M	D	D
13812	E	E	2 ~~E~~ D	D	P	E	D	D	D	D	D	D	D	D

Reviewed By: M. Martin Date: 1-15-01 SCY 1/16/01

RT 01.14.00 EC2-04a

1 Slides 13801-13872 read by ALC Slides 13873-13950 read by MPH. MPH 1-1-01
2 A SCY 1/3/01 3 A SCY 1/4/01 4 A LAS 1-5-01 A MPH 1-1-01
7 SCY 1/3/01 6 A SCY 1/9/01 5 A SCY 1/5/01
7 A SCY 1/10/01 8 Deviation written. F SCY 1/16/01

EXACT COPY JT 9/11/02

000005

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
0 (Vehicle) MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus
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D = Diestrus

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13813	E	M	D	P	E	M	D	P	E	M	D	P	E	M
13814	D	D	P	E	M	D	P	E	E	M	D	D	E	E
13815	E	M	D	P	E	E	M	D	P	E	E	D	D	D
13816	D	D	E	M	D	E	E	M	D	P	E	M	D	D
13817	M	D	P	E	M	E	D	E	D	D	P	E	D	D
13818	D	P	E	E	M	D	E	E	M	D	D	E	D	D
13819	① ~~P~~ D	P	E	D	D	E	E	D	D	P	E	M	D	P
13820	P	E	M	D	P	E	M	E	P	E	M	E	P	E
13821	E	D	D	P	E	D	D	P	E	D	D	E	E	M
13822	E	M	D	P	E	M	D	P	E	D	D	P	M	D
13823	E	M	D	~~D~~ D ③	E	M	D	P	E	M	D	D	E	D
13824	E	D	D ②	D	E	M	D	P	E	M	D	E	E	D
13825	D	E	~~E~~ D	M	D	P	P	D	D	~~E~~ D ④	P	M	D	D
13826	P	E	M	D	P	E	M	D	P	E	D	D	D	E
13827	E	D	D	P	E	M	D	P	E	D	D	P	E	D
13828	P	E	M	D	P	E	M	D	P	E	M	D	D	E
13829	E	E	D	D	P	E	M	D	P	E	M	D	P	E
13830	E	D	D	P	E	D	D	P	E	D	D	D	E	M
	~~D~~ ①													

① Ⓐ alc 1.1.01
② Ⓐ SCY 1/3/01
③ Ⓐ SCY 1/4/01
④ Ⓐ SCY 1/10/01

Reviewed By: M. Martin Date: 1-15-01

RT 01.14.00 EC2-04b

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JT 9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
1 MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

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DATE	1-1-01	1-2-01	1-3-01	1/4/01	1-5-01	1-6-01	1-7-01	1-8-01	1-9-01	1-10-01	1-11-01	1-12-01	1-13-01	1-14-01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13831	D	D	E	E	M	D	(3) ~~D~~ E	E	D	D	(5) ~~D~~ E	E	D	D
13832	E	D	D	D	E	M	(3) ~~E~~ D	D	E	M	D	D	E	D
13833	D	P	E	M	D	P	(3) ~~E~~ E	M	D	P	E	D	D	P
13834	D	P	E	M	D	P	(3) ~~E~~ E	M	D	P	E	D	D	P
13835	D	E	E	D	D	P	E	D	D	P	E	D	D	P
13836	P	E	D	D	P (2) ~~D~~	E	M	D	P	E	(6)	—	—	—
13837	E	E	D	D	D	E	M	D	P	E	M	D	E	E
13838	P	E	D	D	D	E	M	D	D	P	E	D	D	D
13839	D	P	E	M	D	P	E	M	D	P	E	M	D	D
13840	D	P	E	M	D	E	E	E	M	D	D	E	E	E
13841	E	E	M	D	D	E	D	D	P	E	M	D	D	E
13842	E	E	D	D	P	E	D	D	P	E	D	D	D	E
13843	E	D	D	P	E	D	D	E	E	(4) ~~D~~ M	D	P	E	M
13844	P	E	M	D	P	E	M	D	E	E	D	D	E	E
13845	E	E	D	D	P	E	D	D	P	E	M	D	D	E
13846	M	D	E	D	D	D	E	M	D	P	E	M	D	D
13847	P	E	D	D	P	E	D	D	D	E	D	D	E	E
13848	E	D	D	D E (1)	E ~~D~~ (2)	M	D	D	E	M	~~D~~ (7) P	P	E	D
13849	D	D	P	E	M	D	P	E	D	P	E	E	D	D

(1) (A) BOS 1/4/00 (2) (A) BOS 1/5/01 (3) (A) JJB 1-6-01 (4) (A) BOS 1/10/01

Reviewed By: M. Martin Date: 1-15-01

C. O'Brien 8-9-01

(5) (A) DN 1-11-01

(6) Animal Sacrificed on 1/10/01 DN 1/11/01

(7) HOH 8/7/01

RT 01.14.00 EC2-04b

EXACT COPY 9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13850	D	E	D	D	D	E	D	D	P	E	M	D	D	E
13851	D	D	E	E	D	E	P	E	M	D	D	E	M	D
13852	D	E	M	D	D ~~P~~ (2)	E	D	D	P	E	M	D	D	E
13853	P	E	D	D	P	E	M	D	P	E	M	D	D	E
13854	D	E	D	D	~~P~~ (2) D	E	D	D	P	E	M	D	D	E
13855	D	E	M	D	P	E	D	D	P	E	D	D	D	E
13856	P	E	M	D	P	E	M	D	P	E	M	D	D	E
13857	D	D	(1) ~~P~~ D	E	M	D	E	E	M	D	E	E	E	M
13858	D	E	D	D	D	E	(3) ~~P~~ D	D	D	~~D~~ E	D	D	D	E
13859	M	D	E	E	M	D	P	E	D	D	E	E	M	D
13860	E	D	D	P	E	M	D	P	E	D	D	P	E	M

(1) (A) BOY 1/3/00 (2) (A) BOY 1/5/01 (3) (A) JB 1-7-01

Reviewed By: M. Martin Date: 1-15-01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
3 MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

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DATE	1-1-01	1-2-01	1-3-01	1/4/01	1-5-01	1-6-01	1-7-01	1-8-01	1-9-01	1-10-01	1-11-01	1-12-01	1-13-01	1-14-01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13861	E	E	D	D	(1) ~~P~~ D	P	E	D	D	P	E	E	D	D
13862	E	M	D	P	E	D	D	P	E	D	D	P	E	D
13863	D	E	E	D	D	P	E	D	D	E	E	D	D	D
13864	E	E	M	D	D	P	E	D	D	P	E	E	D	D
13865	P	E	D	D	P	E	M	D	P	E	M	D	D	E
13866	E	E	M	D	D	E	E	D	D	P	E	E	D	D
13867	D	D	P	P	E	M	D	D	E	D	D	(2) ~~P~~ D	E	D
13868	E	M	D	P	E	M	D	P	E	M	D	P	E	M
13869	E	D	D	D	E	M	D	D	E	M	D	D	E	M
13870	P	E	D	D	P	E	D	D	P	E	M	D	P	E
13871	D	P	E	M	D	P	E	M	D	P	E	M	D	P
13872	E	M	D	D	E	D	D	D	E	D	D	D	E	D
13873	E	D	D	P	E	D	D	D	E	D	D	D	E	D
13874	P	E	E	D	D	D	E	E	D	D	P	E	E	D
13875	P	E	D	D	E	E	D	D	P	E	M	~~E~~ D (3)	D	E
13876	E	E	M	D	D	E	D	D	P	E	D	D	D	E
13877	E	M	D	D	E	M	D	P	E	D	D	P	E	E
13878	M	D	P	E	D	D	E	E	M	D	P	E	D	D
13879	D	E	D	D	D	E	M	D	D	E	M	D	D	E

(1) ABCY 1/5/01 (2) ABCY 1/12/01

Reviewed By: M. Martin Date: 1-15-01

RT 01.14.00 EC2-04b

EXACT COPY
JF 9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
3 MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

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D = Diestrus

DATE	1.1.01	1.2.01	1.3.01	1/4/01	1.5.01	1.6.01	1.7.01	1.8.01	1.9.01	1.10.01	1.11.01	1.12.01	1.13.01	1.14.01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13880	E	E	D	D	D	E	M	D	D	P	E	D	D	E
13881	P	E	D	D	P	E	E	M	D	P	E	E	D	D
13882	M	D	E	~~D~~ (1) E	M	D	P	E	M	D	E	E	D	D
13883	D	E	M	D	D	E	D	D	D	E	D	D	D	E
13884	M	D	P	E	M	D	P	E	D	D	D	D	E	D
13885	E	E	E	E	E	E	E	E	E	E	E	E	E	E
13886	E	D	D	P	E	E	M	E	E	E	E	E	E	E
13887	E	D	D	(1) ~~D~~ P	E	D	D	P	E	M	D	P	E	D
13888	M	E	D	D	D	E	D	D	P	E	D	D	D	E
13889	E	E	M	D	P	E	D	D	D	E	D	D	E	E
13890	E	D	D	(1) ~~E~~ P	E	D	P	E	E	D	D	D	E	M

(1) (A) [illegible] 1/4/01 (1)

Reviewed By: M. Martin Date: 1-15-01

RT 01.14.00 EC2-04b

EXACT COPY
JT 9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
10 MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

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D = Diestrus

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13891	E	M	D	P	E	D	D	P	E	M	D	P	E	D
13892	E	D	D	P	E	D	D	P	E	D	D	P ~~D~~ (2)	E	M
13893	D	E	M	D	D	E	D	D	D	E	D	D	D	E
13894	D	D	E	M	D	P	E	D	D	D	E	D	D	D
13895	D	E	E	M	D	D	E	M	D	E	E	M	D	D
13896	E	D	D	E	E	D	D	D	E	D	P	D	D	P
13897	E	D	D	D	E	D	D	E	E	D	D	E	E	D
13898	P	E	M	D	P	E	D	D	P	E	M	D	D	E
13899	D	P	E	M	D	P	E	D	D	P	E	M	D	D
13900	D	P	E	E	E	M	P	P	E	E	E	E	D	E
13901	M	D	P	E	M	P	~~D~~ P	E	D	D	E	M	D	D
13902	D	P	E	D	D	P	E	M	D	P	E	M	D	P
13903	M	D	P	E	D	D	P	E	D	D	P	E	M	D
13904	M	D	E	E	D	P	D	E	M	D	D	D	P	D
13905	D	P	E	M	D	D	P	M	E	M	D	D	P	E
13906	E	D	D	D	E	D	P	D	E	M	D	D	E	D
13907	E	E	D	D	D	P	D	P	E	M	D	D	D	E
13908	P	E	M	D	P	E	D	D	P	E	D	D	E	E
13909	E	D	D	P	E	D	D	P	E	D	D	P	E	D

(1) (A) DLF 1/7/01 (3) (A) DS 1/12/01

Reviewed By: M. Martin Date: 1-15-01

RT 01.14.00 EC2-04b

EXACT COPY 9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
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	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13910	D	P	E	D	D	D	E	M	D	D	P	E	D	D
13911	E	M	D	D	E	D	P	D	E	D	D	D	D	E
13912	D	E	D	D	D	E	D	D	D	E	D	D	D	E
13913	M	D	P	E	D	D	P	E	D	D	D	D	D	D
13914	D	D	E	E	D	P	P	D	E	D	D	P	E	E
13915	E	D	D	P	E	D	D	P	E	D	D	P	E	M
13916	D	D	E	E	M	D	P	E	M	D	E	E	D	D
13917	E	E	M	D	P	P	D	D	P	E	M	D	P	E
13918	E	D	D	P	E	D	P	P	E	D	D	P	E	D
13919	M	D	P	E	M	D	P	E	D	D	D	E	M	D
13920	D	D	D	E	M	P	E	E	M	D	E	E	M	D

1/12/01

Reviewed By: M. Martin Date: 1-15-01

RT 01.14.00 EC2-04b

EXACT COPY 9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
30 MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	1-1-01	1.2.01	1.3.01	1/4/01	1.5.01	1-6-01	1-7-01	1.8.01	1.9.01	1.10.01	1.11.01	1.12.01	1.13.01	1-14-01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13921	D	D	E	D	D	P	E	D	D	D	E	D	D	P
13922	D	D	E	D	D	D	E	D	D	D	(1)DE	D	D	P
13923	E	E	D	D	P	E	M	D	P	E	D	D	P	E
13924	P	E	D	D	P	E	M	D	P	E	M	D	P	E
13925	E	M	D	P	E	M	D	P	E	M	E	P	E	D
13926	D	D	E	M	D	P	E	M	D	P	E	M	D	D
13927	D	P	E	M	D	P	E	M	D	P	E	M	D	P
13928	P	E	M	D	D	E	D	D	D	E	M	D	D	E
13929	D	D	P	E	E	E	M	M	M	E	E	E	E	E
13930	D	P	E	M	D	P	E	D	D	P	E	M	D	D
13931	E	D	D	D	E	D	D	P	E	M	D	P	E	D
13932	D	D	P	E	M	D	D	E	D	D	D	E	M	D
13933	D	E	E	E	M	M	P	E	M	D	E	E	E	E
13934	E	D	D	E	E	M	D	P	E	D	D	E	E	D
13935	E	E	M	D	D	P	E	D	D	E	E	M	D	D
13936	E	E	D	D	E	D	P	P	E	D	D	D	E	D
13937	D	D	E	E	D	P	P	E	D	D	D	E	D	D
13938	D	E	E	D	D	P	E	D	D	P	E	D	D	D
13939	D	E	E	D	D	P	E	D	D	D	E	D	D	D

(1)(2) DN 1.11.01

Reviewed By: M. Martin Date: 1-15-01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
30 MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	1-1-01	1-2-01	1-3-01	1/4/01	1-5-01	1-6-01	1-7-01	1-8-01	1-9-01	1-10-01	1-11-01	1-12-01	1-13-01	1-14-01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13940	E	D	D	D	E	M	D	D	P	P	E	M	D	D
13941	D	E	D	D	D	E	D	D	D	E	M	D	P	E
13942	P	E	D	D	P	M	D	D	P	E	M	D	D	E
13943	E	D	D	D	E	D	D	D	D	E	D	D	D	E
13944	D	P	E	M	D	D	E	E	D	P	E	M	D	P
13945	D	E	E	D	D	P	E	M	D	E	E	D	D	D
13946	E	M	~~E~~ D	P	E	D	P	P	E	E	D	P	E	D
13947	D	E	E	D	D	D	E	M	D	D	E	E	D	D
13948	D	D	D	E	M	M	D	E	M	E	D	P	E	D
13949	M	D	E	E	M	P	P	E	M	E	E	E	D	D
13950	E	D	D	P	E	M	P	E	E	D	D	P	E	M

① Ⓐ alc 1-3-01

Reviewed By: M. Martin Date: 1-15-01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
0 (Vehicle) MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	1-15-01	1-16-01	1-17-01	1-18-01	1/19/01	1/20/01	1/21/01							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Saline Pre-Check Tech/Time	VRL/ 1135	1115 SCY	1129 KMC	1130 SCY	1120 JY	1129 JSC	1129 CAR							
Saline Post-Check Tech/Time	VRL/ 1206	SCY 1142	KMC 1156	SCY 1200	KMC 1153	1208 JL	1238 JL							
Smears Taken Tech/Time Start	VRL/TH/KMC 1136	1117 SCY/AM/TH/KMC	1132 KMC/JY/CW	1135 KMC/SCY/DO/TR	1127 KMC/JY/DF/JM	1132 JSC/SA/AM	1181 CAR/JL							
Smears Taken Time End	1204	1140	1154	1159	1153	1156	1154							
Smears Read Tech/Time Start	VRL/ 1207	SCY 1143	SCY 1205	SCY 1201	KMC 1154	1208 JL	1238 JL							
Smears Read Time End	1249	1206	1304	1254	1243	1253	1336							
Animal Number														
13801	P	E	D	D	E	E	D							
13802	E	D	D	D	E	D	P							
13803	P	E	D	D	D	E	E							
13804	D	D	P	E	①									
13805	D	D	P	E	D	P	D							
13806	D	D	P	E	D	D	P							
13807	E	M	D	P	E	D	D							
13808	M	D	P	E	M	D	P							
13809	D	P	E	M	D	P	E							
13810	E	D	D	D	E	M	D							
13811	D	D	D	D	D	P	E							
13812	D	D	D	D	D	E	D							

Reviewed By: _____ Date: 1/25/01

① Animal was moribund sacrificed. SCY 1/19/01

RT 01.14.00 EC2-04a

EXACT COPY
JF 9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
0 (Vehicle) MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus
E = Estrus
M = Metestrus
D = Diestrus

DATE	1.15.01	1.16.01	1.17.01	1.18.01	1-19-01	1-20-01	1-21-01							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13813	D	E	E	M	D	P	E							
13814	M	D	D	P	E	M	D							
13815	E	E	M	D	D	P	E							
13816	P	E	M	D	D	P	E							
13817	E	E	M	D	E	E	M							
13818	P	E	M	D	P	E	M							
13819	E	M	D	E	E	D	D							
13820	M	D	D	E	E	D	D							
13821	D	D	E	M	D	P	E							
13822	D	P	E	M	D	P	E							
13823	D	P	E	M	D	P	E							
13824	E	D	E	M	D	E	E							
13825	E	M	D	D	P	E	M							
13826	D	D	D	E	D	P	E							
13827	D	E	E	M	D	P	E							
13828	M	D	P	E	D	D	P							
13829	D	D	P	E	D	D	P							
13830	D	D	E	D	D	D	E							

Reviewed By: _____ Date: 1/25/01

RT 01.14.00 EC2-04b

EXACT COPY
JT 9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
1 MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	1-15-01	1-16-01	1-17-01	1-18-01	1-19-01	1-20-01	1-21-01							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13831	D	E	D	D	D	E	M							
13832	D	D	E	M	D	D	E							
13833	E	D	D	P	E	M	D							
13834	E	M	D	P	E	D	D							
13835	E	D	D	P	E	D	D							
13836														
13837	D	D	P	E	D	D	E							
13838	P	P	D	D	D	D	D							
13839	E	D	D	P	E	D	D							
13840	D	P	E	D	D	D	E							
13841	D	D	E	E	D	D	D							
13842	D	D	P	E	D	D	D							
13843	D	P	E	M	D	P	E							
13844	M	D	P	E	D	D	P							
13845	M	D	P	E	D	D	P							
13846	E	E	M	D	D	E	E							
13847	D	D	P	E	D	D	P							
13848	D	D	E	D	D	E	E							
13849	P	E	M	D	P	E	M							

Reviewed By: _____ Date: 1/25/01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
1 MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	1-15-01	1-16-01	1-17-01	1-18-01	1-19-01	1-20-01	1-21-01							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13850	D	D	P	E	M	D	E							
13851	D	E	M	D	D	D	E							
13852	M	D	P	E	D	D	P							
13853	M	D	P	E	D	D	P							
13854	D	D	P	E	D	D	P							
13855	D	D	P	E	D	D	P							
13856	M	D	P	E	D	D	P							
13857	D	D	E	E	M	E	E							
13858	D	D	D	E	D	D	D							
13859	P	E	M	D	P	E	D							
13860	D	P	E	M	D	P	E							

Reviewed By: _____ Date: 1/25/01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
3 MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	1-15-01	1-16-01	1-17-01	1-18-01	1-19-01	1-20-01	1-21-01							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13861	D	E	E	D	D	D	P							
13862	D	P	E	D	D	P	E							
13863	E	D	D	P	E	D	D							
13864	E	E	M	D	D	E	E							
13865	M	D	P	E	D	D	P							
13866	D	E	E	D	D	D	D							
13867	D	D	E	M	D	P	E							
13868	D	P	E	D	D	P	E							
13869	P	D	E	D	D	D	E							
13870	D	D	P	E	D	D	P							
13871	E	D	D	P	E	D	D							
13872	D	D	E	D	D	D	E							
13873	D	P	E	D	D	P	E							
13874	D	P	E	E	D	D	P							
13875	M	D	P	E	D	D	D							
13876	M	D	P	E	D	D	P							
13877	M	D	D	E	E	D	D							
13878	P	E	M	M	D	P	E							
13879	D	D	D	E	D	D	E							

Reviewed By: _____ Date: 1/25/01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
3 MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	1-15-01	1-16-01	1-17-01	1-18-01	1-19-01	1-20-01	1-21-01							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13880	D	D	P	E	D	D	P							
13881	E	E	M	D	D	P	E							
13882	E	E	M	D	R ① ②	E	M							
13883	M	D	D	E	D	D	D							
13884	D	P	E	D	D	D	E							
13885	E	M	M	E	E	E	E							
13886	E	E	M	E	E	E	E							
13887	D	P	E	D	D	P	E							
13888	D	D	D	E	D	D	P							
13889	M	D	D	E	D	D	P							
13890	D	D	E	D	D	D	E							

① (A) KMC 1-19-01

Reviewed By: D Smith Date: 1/25/01

RT 01.14.00 EC2-04b

② estrus cycle inadvertently not recorded 1/25/01

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
10 MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	1-15-01	1-16-01	1-17-01	1-18-01	1-19-01	1-20-01	1-21-01							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13891	D	D	E	M	D	D	E							
13892	D	D	E	M	D	P	E							
13893	D	D	D	E	D	D	P							
13894	E	D	D	D	E	D	D							
13895	E	M	D	P	E	M	D							
13896	E	D	D	D	E	D	D							
13897	D	D	E	D	D	D	E							
13898	M	D	P	E	D	D	P							
13899	P	E	D	D	D	E	D							
13900	E	E	E	E	E	E	E							
13901	E	E	M	D	D	P	E							
13902	E	D	D	P	E	D	P							
13903	P	E	M	D	P	E	M							
13904	D	D	D	P	P	D	D							
13905	E	D	D	P	E	E	D							
13906	D	D	E	M	D	P	E							
13907	M	D	P	E	D	D	P							
13908	D	D	P	E	M	D	P							
13909	P	P	E	M	D	P	E							

Reviewed By: _____ Date: 1/25/01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
10 MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	1-15-01 ~~1-16-01~~ ①	1-16-01	1-17-01	1-18-01	1-19-01	1-20-01	1-21-01							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13910	D	D	E	M	E	D	D							
13911	M	D	D	E	D	D	D							
13912	M	D	D	P	E	D	D							
13913	E	E	M	D	D	E	D							
13914	M	D	P	P	E	M	D							
13915	D	P	E	M	D	P	E							
13916	D	E	M	D	P	E	M							
13917	M	D	D	D	M	D	P							
13918	D	P	E	D	D	P	E							
13919	E	E	M	D	P	E	M							
13920	E	E	M	D	D	E	D							

① @ MK 1-15-01

Reviewed By: _____ Date: 1/25/01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
30 MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	1-15-01	1-16-01	1-17-01	1-18-01	1-19-01	1-20-01	1-21-01							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13921	E	D	D	P	E	D	D							
13922	E	D	D	P	E	D	D							
13923	D	D	P	E	D	D	P							
13924	M	D	P	E	D	E	P							
13925	D	P	E	M	D	P	E							
13926	E	M	D	P	E	D	P							
13927	E	D	D	P	E	D	P							
13928	M	D	P	E	D	D	P							
13929	E	E	E	E	M	E	E							
13930	E	M	D	P	E	D	P							
13931	D	P	E	M	D	P	E							
13932	P	E	D	D	D	E	D							
13933	D	P	E	M	D	E	E							
13934	D	P	E	M	D	P	E							
13935	E	E	M	E	E	D	D							
13936	D	D	E	D	D	D	E							
13937	E	E	D	P	D	E	M							
13938	E	M	D	P	P	D	D							
13939	E	M	D	P	E	D	D							

Reviewed By: _____ Date: _____

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
30 MKD	P	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	1-15-01	1-16-01	1-17-01	1-18-01	1-19-01	1-20-01	1-21-01	1-22-01						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
13940	E	E	M	D	P	E	M							
13941	M	D	P	E	D	D	P							
13942	M	D	P	E	D	D	P							
13943	D	D	D	E	D	D	D							
13944	E	M	D	P	E	M	D							
13945	E	M	D	D	E	M	D							
13946	D	D	E	D	D	E	E							
13947	P	E	M	D	D	P	E							
13948	D	D	E	D	D	D	E							
13949	D	E	D	D	P	E	M							
13950	D	D	E	M	D	D	E							

Reviewed By: _____ Date: 1/25/01

8-7-01 C. O Brien 8/9/01

RT 01.14.00 EC2-04b

EXACT COPY 9/11/02

ESTROUS CYCLE EVALUATION

F1 GENERATION FEMALE RATS

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
0 MKD	F1	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus
E = Estrus
M = Metestrus
D = Diestrus

DATE	5-8-01	5/9/01	5/10/01	5-11-01	5-12-01	5-13-01	5-14-01	5-15-01	5-16-01	5-17-01	5/18/01	5-19-01	5-20-01	5-21-01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Saline Pre-Check Tech/Time	MPH 1235	DS 1235	DS 1242	CO 1214	CJ 1233	MKF 1231	DMD 1240 (2)	AMM 1241	DC 1232	DMD 1228	HLP 1230	CMD 1055	MKF 1201	DMD 1240
Saline Post-Check Tech/Time	MPH 1309	DS 1332	DS 1330	DS 1315	CJ 1311	MKF 1302	CLP 1328	AMM 1310	DC 1305	DC 1306	1257 TK	CMD 1130	CAR 1300	DS 1326
Smears Taken Tech/Time Start	1239 ABH/JSW	1238 DS/JSW JP	1246 JSW/DS	CO/DS 1230 JP	CJ/ABH/JSW 1236	MKF/DC ABH 1234	DMD/AB 1235	ABH/AMM BM 1245	BM/ABH 1240	DMD/ABH/DC 1239	HLP/DMD 1234	CMD/RJK HLP 1101	MKF/CAR 1213	DMD/AMM 1244
Smears Taken Time End	1308	1330	1328	1300	1306	1259	1317	1305	1301	1302	1256	1124	1258	1320
Smears Read Tech/Time Start	MPH 1309	DS 1332	DS 1330	DS 1315	CJ 1311	MKF 1302	CLP 1328	AMM/AAB 1311	DC 1306	DC 1307	1257 TK	CMD 1133	CAR 1301	DS 3 (D) 1326 AR 12/18/01
Smears Read Time End	1405	1358	1402	1350	1347	1335	1350	1333	1337	1349	1321	1158	1350	1347
Animal Number		(A) DS 5/9/01												
1302	E	~~M~~ D	D	P	E	D	D	P	E	M	D	D	E	D
1304	D	P	E	D	D	P	E	D	D	E	E	D	D	P
1306	E	D	D	P	E	M	D	P	E	M	D	P	E	D
1308	M	D	E	E	D	E	E	M	D	D	E	M	D	D
1310	M	D	P	E	D	P	P	E	D	D	P	E	D	D
1312	E	E	M	D	P	E	E	M	D	D	P	E	D	D
1313	D	E	D	D	P	E	M	D	P	E	M	D	P	E
1316	D	P ~~D~~ (1)	E	E	M	D	D	E	E	M	D	D	E	D
1318	M	D	P	D	D	D	D	P	E	M	D	D	D	E
1321	D	D ~~E~~ (1)	P	P	D	D	P	E	D	D	P	E	D	D
1325	E	E	D	D	P	E	M	D	E	E	D	D	P	E
1328	E	D	D	P	E	M	D	P	E	M	D	D	E	M

Reviewed By: Russell A. Gazzara Date: 5/28/01

(1) (A) DS 5/9/01

(2) Precheck not performed prior to initiation of smears being taken; Deviation written. AR 12/18/01

RT 01.14.00 EC2-04a

AR 12/8/01

EXACT COPY
JT 9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
0 MKD	F1	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus
E = Estrus
M = Metestrus
D = Diestrus

DATE	5/8/01	5/9/01	5/10/01	5/11/01	5/12/01	5-13-01	5-14-01	5-15-01	5-16-01	5-17-01	5-18-01	5-19-01	5-20-01	5/21/01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
1330	M	D	P	E	~~E~~ D ②	D	P	E	D	D	P	E	M	D
1331	D	D	D	D	~~D~~ P ②	D	D	E	E	E	M	D	D	P
1334	D	P	E	M	D	P	E	M	E	E	E	D	D	P
1335	~~M~~ D ①	D	P	E	D	D	P	E	M	D	P	E	M	D
1336	D	D	P	E	P	D	P	E	M	D	P	E	M	D
1338	D	E	M	D	D	P	E	M	D	P	E	D	D	P
1340	E	D	D	D	P	D	D	D	D	D	D	P	D	D
1341	D	E	E	D	D	P	E	D	D	P	E	D	D	P
1342	D	E	E	D	D	P	E	E	D	D	P	P	E	D
1344	D	P	E	D	D	D	E	E	M	D	D	E	M	D
1345	E	M	D	D	P	E	M	M	E	M	D	D	P	E
1346	D	D	P	E	D	D	E	E	E	③ M E	D	E	E	E
1348	P	E	D	D	P	E	M	D	P	E	M	D	P	E
1350	E	E	D	D	D	E	M	D	D	E	M	D	D	P
1353	D	D	D	D	P	E	D	D	P	E	M	D	D	P
1355	M	D	P	E	D	D	D	E	M	D	E	E	M	D
1358	D	P	E	M	D	D	D	E	D	D	P	E	D	D
1359	D	D	D	E	E	M	D	D	E	E	E	D	D	P

① Ⓘ MPH 5-7-01 ② Ⓐ CJ 5-12-01 ③ Ⓐ DC 5-17-01

Reviewed By: Russell A. Hoggard Date: 5/28/01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
1 MKD	F1	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	5/8/01	5/9/01	5/10/01	5/11/01	5-12-01	5-13-01	5-14-01	5-15-01	5-16-01	5-17-01	5-18-01	5-19-01	5-20-01	5/21/01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
1362	E	D	D	③ ~~D~~ E	E	M	D	E	E	M	D	P	E	D
1363	D	D	P	③ ~~D~~ E	D	D	P	E	M	M	D	E	D	D
1364	D	D	P	E	M	D	P	E	M	D	E	E	D	D
1367	E	D	D	P	E	M	D	P	E	D	D	P	E	D
1368	M	D	P	E	D	D	P	E	M	D	P	E	D	D
1371	D	D	D	E	M	D	D	P	E	M	D	P	E	D
1375	D	P	E	D	D	P	E	D	D	E	E	D	D	E
1376	E	D	D	D	P	E	M	D	P	E	E	D	D	P
1378	E	D	D	E	D	D	D	E	E	M	D	P	E	D
1379	E	D	D	P	E	D	D	P	E	D	D	P	E	D
1381	E	D	D	P	E	D	D	E	E	M	D	D	E	D
1382	D	D	E	E	D	D	P	E	M	M	D	E	M	D
1383	~~M~~ E ①	E	M	D	D	P	E	M	D	D	D	D	D	P
1384	D	P ~~D~~ ②	E	D	D	E	E	D	D	E	E	D	D	P
1387	P	D	E	E	D	D	P	E	E	M	D	P	E	E
1389	D	D	D	D	D	P	P	M	D	P	E	D	D	E
1392	E	D	D	P	E	M	D	P	E	M	D	P	E	D
1393	E	D	D	P	E	M	D	D	E	E	E	D	D	P
1397	D	P	E	D	D	P	E	D	D	D	E	D	D	E

① Ⓐ MPH 5-8-01
② Ⓐ DS 5/9/01
③ Ⓒ DS 5/11/01

Reviewed By: Russell A. Gazzara Date: 5/28/01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
1 MKD	F1	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	5/8/01	5/9/01	5/10/01	5/11/01	5-12-01	5-13-01	5-14-01	5-15-01	5-16-01	5-17-01	5-18-01	5-19-01	5-20-01	5/21/01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
1399	m	D	P	E	m	D	P	E	M	D	P	E	m	D
1401	D	P	E	D	D	P	E	m	D	P	E	M	D	P
1404	P	E	M	D	P	E	E	m	D	P	E	E	m	D
1407	D	D	P	E	D	D	P	E	M	D	D	E	D	D
1409	D	D	P	E	D	D	P	E	E	D	D	D	P	E
1410	D	E	E	E	D	D	P	E	M	D	D	P	E	E
1413	E	D	D	P	E	D	D	P	E	D	D	P	E	D
1415	P	E	M	D	D	P	E	D	D	E	E	E	m	D
1416	P	E	D	D	P	E	M	D	P	E	D	P	E	E
1418	D	P	E	D	D	P	E	m	D	P	E	D	D	P

Reviewed By: Russell A. Hoggard Date: 5/28/01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
3 MKD	F1	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	5/8/01	5/9/01	5/10/01	5/11/01	5-12-01	5/13/01	5-14-01	5-15-01	5-16-01	5-17-01	5/18/01	5-19-01	5-20-01	5/21/01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
1421	D	E	D	D	E	E	M	D	P	E	D	D	D	E
1424	M	D	P	E	M	M	D	E	E	D	D	D	E	E
1426	E	E	M	D	D	E	E	M	D	D	E	E	D	D
1428	D	①RD	D	E	M	D	D	P	E	P	D	E	E	E
1430	D	P	E	D	D	P	E	M	D	E	E	M	D	P
1431	P	E	M	D	P	E	M	D	P	D	M	D	P	E
1433	D	D	P	E	M	E	D	E	M	D	P	E	D	D
1436	E	D	D	E	E	M	D	E	E	E	D	D	E	D
1437	E	D	D	P	E	D	D	P	E	D	D	D	P	E
1439	M	D	E	P	D	D	E	E	M	P	P	E	D	D
1442	E	D	D	D	D	P	E	M	D	E	E	E	D	D
1443	D	D	D	E	E	D	D	D	E	E	D	D	D	P
1446	D	D	D	D	D	P	E	D	P	P	E	D	D	P
1448	D	P	E	M	D	P	E	D	D	~~D~~P ②	E	M	D	P
1450	D	D	D	E	D	D	D	E	M	~~E~~D ②	D	E	M	D
1452	D	E	D	D	P	D	D	D	P	~~D~~E ②	D	D	D	E
1455	E	D	D	P	E	D	D	E	E	~~E~~D ②	D	D	E	D
1456	E	D	D	P	E	E	M	M	M	~~D~~M ②	D	D	P	E
1458	D	D	E	E	D	E	D	E	M	D	D	P	E	M

①D 5/9/01 ② A DC 5-17-01

Reviewed By: Russell A. Hoggan Date: 5/24/01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
3 MKD	F1	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	5/8/01	5/9/01	5/10/01	5/11/01	5/12/01	5/13/01	5/14/01	5/15/01	5/16/01	5/17/01	5/18/01	5/19/01	5/20/01	5/21/01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
1459	D	D	D	P	E	D	D	D	E	①M	D	D	E	M
1461	D	E	P	E	M	D	D	D	E	①D	M	P	E	E
1463	D	E	E	D	D	P	E	P	M	①M	E	M	D	E
1465	E	E	E	M	D	E	E	P	M	D	D	E	E	D
1468	E	D	D	P	E	M	D	E	E	①M	D	E	E	M
1469	D	P	E	E	D	D	P	D	D	①D	P	E	M	D
1472	E	E	D	D	D	P	E	E	M	P	E	D	D	D
1474	D	E	E	D	D	P	E	E	M	①P	E	M	D	P
1476	E	D	D	P	E	D	D	D	E	D	D	P	E	D
1477	E	D	D	P	E	D	D	D	E	D	D	P	E	D
1480	D	E	E	D	D	P	E	D	D	①D	D	D	E	D

①Ⓐ DC 5-17-01

Reviewed By: Russell A. Hoggan Date: 5/28/01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
10 MKD	F1	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	5/8/01	5/9/01	5/10/01	5/11/01	5-12-01	5/13/01	5-14-01	5-15-01	5-16-01	5-17-01	5-18-01	5-19-01	5-20-01	5/21/01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
1482	E	M	D	P	E	E	D	P	P	E	M	D	P	E
1483	D	E	E	D	D	P	E	M	D	D	P	E	M	D
1486	E D	D	E	M	D	D	E	D	D	D	D	P	E	D
1488	D E	D	D	D	P	E	M	E	E	E	D	D	D	E
1490	E	E	D	D	P	E	D	E	P	E	M	D	P	E
1491	D	P	E	D	D	P	E	E	D	P	E	D	D	P
1494	D	E	D	D	P	P	M	D	E	E	E	D	D	D
1496	D	P	E	D	D	P	E	D	D	P	E	D	D	P
1497	E	D	D	P	D	M	D	P	E	M	D	P	E	D
1500	D	E	E	D	D	P	E	D	D	P	E	E	D	D
1502	D	D	D	D	P	D	D	D	E	E	D	D	D	D
1505	D	D	P	E	D	D	D	E	M	D	D	E	D	D
1507	E	D	D	P	E	D	D	E	E	D	D	P	E	D
1508	E	M	D	P	E	M	D	P	E	M	D	D	E	D
1511	E	D	D	D	D	P	D	D	E	E	M	D	D	P
1513	D	P	E	D	D	P	E	D	D	P	E	D	D	P
1514	E	E	E	D	D	E	E	D	D	E	E	D	D	P
1516	E	D	D	P	E	D	D	P	E	D	D	D	E	D
1517	E	E	D	D	P	E	M	D	P	E	D	D	D	E

(1)(A) MPH 5-8-01

Reviewed By: Russell A. Hazzard Date: 5/28/01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
10 MKD	F1	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	5/8/01	5/9/01	5/10/01	5/11/01	5-12-01	5/13/01	5-14-01	5-15-01	5-16-01	5-17-01	5-18-01	5-19-01	5-20-01	5/21/01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
1519	D	D	D	E	D	D	P	E	D	D	P	E	D	D
1521	E	D	D	P	E	D	D	P	E	M	D	P	E	D
1523	E	D	D	D	E	M	D	D	E	M	D	P	E	M
1524	P	E	D	D	P	E	D	D	P	E	D	D	P	E
1527	E	M	D	D	D	E	M	D	D	P	E	E	M	D
1528	D	D	P	E	D	D	D	E	M	D	E	E	D	D
1531	D	D	P	M	E	D	D	D	E	M	D	D	D	P
1533	D	D	P	E	M	D	P	E	M	D	P	E	M	D
1534	P	E	D	D	P	E	M	D	P	E	D	D	P	E
1537	D	D	P	E	D	D	P	E	D	D	P	E	~~P~~ D	D
1539	E	D	D	P	D	P	D	D	P	E	E	D	D	D

Reviewed By: Russell A. Gazzara Date: 5/28/01

RT 01.14.00 EC2-04b

(1) (D) CAR 6-30-01

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
30 MKD	F1	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	5/8/01	5/9/01	5/10/01	5/11/01	5-12-01	5/13/01	5-14-01	5-15-01	5-16-01	5-17-01	5-18-01	5-19-01	5-20-01	5/21/01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
1541	D	P	E	M	D	E	E	D	D	P	E	D	D	D
1544	E	M	D	P	E	D	D	E	E	M	D	E	E	M
1545	M	D	P	E	D	D	D	E	M	D	P	E	D	D
1546	E	D	D	E	E	D	D	E	E	D	D	E	E	D
1548	D	D	P	E	M	D	P	E	E	D	P	E	D	D
1550	P	E	M	D	P	E	M	D	P	E	M	D	E	E
1552	M	D	D	E	D	D	D	E	M	D	P	E	D	D
1555	E	D	D	P	E	D	D	P	E	D	D	E	E	D
1557	D	P	E	D	D	P	E	D	D	P	E	D	D	P ~~E~~ (A) 5/21/01
1558	E	D	D	E	E	E	M	D	P	E	M	D	P	E
1560	P	E	D	D	P	E	M	D	D	E	M	D	D	E
1564	D	D	P	E	D	D	P	E	M	D	P	E	M	D
1565	D	E	E	D	P	E	E	D	D	E	~~D~~ E	M	D	P
1566	E	D	D	P	E	D	D	M	E	M	D	D	D	D
1568	D	D	P	E	M	D	P	E	M	D	P	E	E	D
1571	D	D	P	E	D	D	P	E	M	D	P	E	M	D
1573	P	E	D	D	D	D	P	D	D	P	E	D	D	P
1576	D	D	D	P	E	E	D	E	E	D	D	E	E	D
1578	E	D	D	P	E	E	D	D	E	D	D	E	E	M

(1)(A) TK 5.14.01

Reviewed By: Russell A. Gazzara Date: 5/28/01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	TEST ARTICLE/SUBSTANCE:		TYPE OF TEST:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**SPECIES/STRAIN:**
30 MKD	F1	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus

E = Estrus

M = Metestrus

D = Diestrus

DATE	5/8/01	5/9/01	5/10/01	5/11/01	5/12/01	5/13/01	5/14/01	5/15/01	5/16/01	5/17/01	5/18/01	5/19/01	5/20/01	5/21/01
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Animal Number														
1579	D	P	E	D	D	P	E	D	D	E	E	D	D	P
1583	E	E	M	D	D	E	E	D	D	D	P	E	D	D
1584	P	E	M	D	D	E	D	D	P	E	M	E	D	E
1586	E	D	D	P	E	D	D	P	E	D	D	P	E	M
1587	E	D	D	P	E	E	D	D	P	E	E	D	D	P
1588	D	P	E	D	D	E	E	D	D	P	E	D	D	D
1589	E	M	D	D	D	E	M	D	E	E	M	D	D	P
1591	D	P	E	D	D	D	P	D	D	P	E	D	D	P
1593	P	E	D	D	P	E	M	D	P	E	D	D	P	E
1598	D	D	P	E	M	D	D	P	E	D	D	P	E	D
1600	E	D	D	E	E	M	D	P	E	D	D	E	E	D

Reviewed By: Russell A. Hazzard Date: 5/28/01

RT 01.14.00 EC2-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	Test Article/Substance:		Type of Test:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**Species/Strain:**
0 MKD	F1	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus
E = Estrus
M = Metestrus
D = Diestrus

Date	5/22/01	5.23.01	5.24.01	5.25.01	5.26.01	5/27/01	5/28/01
	1	2	3	4	5	6	7
Saline Pre-Check Tech/Time	ALP 1232	PC 1232	PC 1234	PC 1101	JSW 1102	ABH 1104	DC 1105
Saline Post-Check Tech/Time	ALP 1319	PC 1327	PC 1328	PC 1202	JSW 1139 ①	PC 1150	BM 1159
Smears Taken Tech/Time Start	ALP/JSW/ABH 1237	PC/ABH/ABH 1246	1246 PC/ABH	PC/ABH/ 1114	OH/ABH/JSW 1113	ABH/ABH/AAK 1106	ABH/AAK WAN/CH 1115
Smears Taken Time End	1312	1322	1320	1151	JSW 5.26.01 1141	1135	1150
Smears Read Tech/Time Start	ALP 1319	PC 1328	PC 1329	PC 1202	JSW/TYM 1146	PC 1150	BM 1159
Smears Read Time End	1407	1429	1417	1301	1216	1222	1226
ANIMAL NUMBER							
1302	D	~~D~~ P	E	M	D	P	E
1304	E	~~D~~ M	D	P	E	D	D
1306	D	P	E	M	D	P	E
1308	E	M	M	D	E	M	D
1310	P	E	M	D	D	F	M
1312	D	P	E	M	D	D	P
1313	D	D	D	P	M	D	D
1316	D	P	E	M	D	D	E
1318	D	D	D	D	E	E	D
1321	P	E	M	D	D	E	M
1325	D	D	P	E	M	E	E
1328	D	P	E	M	D	E	E
1330	D	E	M	D	E	E	M

① PC 5.23.01

Reviewed By: Russell A. Gagnon Date: 5/28/01

① Postcheck not performed at completion of obtaining vaginal smears; deviation written. AR 12/18/01

RT 01.14.00 EC1.04a

AR 12/18/01

EXACT COPY
9/11/02

Argus

PROTOCOL: 418-020	Test Article/Substance: APFO		Type of Test: Estrous Cycle Evaluation
DOSAGE: 0 MKD	GENERATION: F1	ROUTE: Oral (Gavage)	Species/Strain: Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus
E = Estrus
M = Metestrus
D = Diestrus

Date	5-22-01	5-23-01	5-24-01	5-25-01	5-26-01	5-27-01	5-28-01
	1	2	3	4	5	6	7
ANIMAL NUMBER							
1331	E	M	D	D	E	E	P
1334	E	M	D	P	E	D	D
1335	P	E	M	D	P	E	E
1336	P	E	M	D	D	E	M
1338	E	M	D	P	E	M	D
1340	E	E	M	D	M	E	E
1341	D ~~E~~ [illegible]	D	D	E	E	D	E
1342	D	P	E	E	D	D	P
1344	D ~~E~~ [illegible]	E	M	D	D	P	E
1345	D	D	E	E	M	D	D
1346	E	E	E	E	M	P	E
1348	M	D	P	E	M	D	P
1350	E	D	D	P	E	M	M
1353	E	E	M	D	D	E	M
1355	D	E	D	D	E	E	E
1358	P	E	M	D	E	E	E
1359	E	E	M	D	D	E	E

Reviewed By: Russell A. Gazzara Date: 5/28/01

RT 01.14.00 EC1-04b

EXACT COPY
9/11/02

Argus

PROTOCOL: 418-020	Test Article/Substance: APFO		Type of Test: Estrous Cycle Evaluation
DOSAGE: 1.0 MKD	GENERATION: F1	ROUTE: Oral (Gavage)	Species/Strain: Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus
E = Estrus
M = Metestrus
D = Diestrus

Date	5.22.01	5.23.01	5.24.01	5.25.01	5.26.01	5.27.01	5.28.01
	1	2	3	4	5	6	7
ANIMAL NUMBER							
1362	D	P	E	M	D	D	E
1363	D	E	M	D	E	E	D
1364	P	E	M	D	E	E	D
1367	D	P	E	M	D	P	E
1368	P	E	M	D	E	E	D
1371	D	P	E	M	D	D	E
1375	E	D	D	D	M	D	E
1376	E	E	M	D	P	E	E
1378	D	D	E	D	D	D	E
1379	D	P	E	M	D	D	E
1381	D	D	E	~~P~~ M	D	D	E
1382	P	E	M	D	E	E	D
1383	D	D	D	D	E	P	E
1384	E	M	D	P	E	D	D
1387	M	D	P	E	M	D	E
1389	E	M	D	P	E	M	M
1392	D	P	E	M	E	E	E
1393	E	M	D	D	E	M	D
1397	E	M	D	P	E	M	D
1399	P	E	M	D	D	E	E
1401	E	M	D	P	E	M	M

(1)(A) P 5.25.01

Reviewed By: Russell A. Gazzara

Date: 5/28/01

RT 01.14.00 EC1-04b

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9/11/02

Argus

PROTOCOL: 418-020	Test Article/Substance: APFO		Type of Test: Estrous Cycle Evaluation
DOSAGE: 1.0 MKD	GENERATION: F1	ROUTE: Oral (Gavage)	Species/Strain: Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus
E = Estrus
M = Metestrus
D = Diestrus

Date	5.22.01	5.23.01	5.24.01	5.25.01	5.26.01	5.27.01	5.28.01
	1	2	3	4	5	6	7
ANIMAL NUMBER							
1404	P	E	E	M	D	D	E
1407	P	E	M	D	P	E	E
1409	D	D	D	P	M	D	D
1410	M	D	D	P	M	D	D
1413	D	D	E	M	D	D	E
1415	D	E	E	M	D	D	P
1416	M	D	P	E	M	D	P
1418	E	M	D	P	E	M	M

Reviewed By: Russell A. Gazzara Date: 5/28/01

RT 01.14.00 EC1-04b

EXACT COPY
JF 9/11/02

Argus

PROTOCOL: 418-020	Test Article/Substance: APFO		Type of Test: Estrous Cycle Evaluation
DOSAGE: 3.0 MKD	GENERATION: F1	ROUTE: Oral (Gavage)	Species/Strain: Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus
E = Estrus
M = Metestrus
D = Diestrus

Date	5220 1	5.23.01 2	5.24.01 3	5.25.01 4	5-26-01 5	5.27.01 6	5.28.01 7
ANIMAL NUMBER							
1421	D	D	E	E	M	D	E
1424	D	D	D	E	M	D	P
1426	D	E	E	M	E	D	E
1428	D	D	D	P	E	D	E
1430	E	M	D	P	E	M	D
1431	D	D	P	E	M	D	P
1433	P	E	M	D	D	E	D
1436	D	E	E	M	D	D	E
1437	E	M	D	P	D	E	M
1439	P	E	M	D	P	E	M
1442	D	E	E	D	D	D	E
1443	E	M	D	E	E	D	D
1446	E	E	M	D	P	E	E
1448	D	M	D	P	E	M	D
1450	D	E	M	D	E	E	D
1452	D	M	D	P	M	D	E
1455	D	M	E	M	D	P	E
1456	D	D	P	E	E	M	E
1458	D	D	E	E	D	D	P
1459	D	D	E	E	D	D	D
1461	D	D	D	P	E	D	P

Reviewed By: Russell A. Hazzard Date: 5/28/01

RT 01.14.00 EC1-04b

EXACT COPY
JT 9/11/02

Argus

PROTOCOL: 418-020	Test Article/Substance: APFO		Type of Test: Estrous Cycle Evaluation
DOSAGE: 3.0 MKD	GENERATION: F1	ROUTE: Oral (Gavage)	Species/Strain: Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus
E = Estrus
M = Metestrus
D = Diestrus

Date	5.22.01	5.23.01	5.24.01	5.25.01	5.26.01	5.27.01	5.28.01
	1	2	3	4	5	6	7
ANIMAL NUMBER							
1463	E	M	D	E	E	M	D
1465	D	P	E	E	D	D	E
1468	D	P	E	M	D	P	E
1469	D	E	E	M	M	D	E
1472	E	E	D	D	D	P	E
1474	E	M	D	P	E	M	D
1476	D	P	E	D	D	P	E
1477	D	P	E	M	D	P	E
1480	D	D	E	E	M	D	D

Reviewed By: Russell A. Hazzard Date: 5/28/01

RT 01.14.00 EC1-04b

EXACT COPY
9/11/02

Argus

PROTOCOL:	Test Article/Substance:		Type of Test:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**Species/Strain:**
10.0 MKD	F1	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus
E = Estrus
M = Metestrus
D = Diestrus

Date	5.22.01	5.23.01	5.24.01	5.25.01	5.26.01	5.27.01	5.28.01
	1	2	3	4	5	6	7
ANIMAL NUMBER							
1482	D	D	P	E	M	D	E
1483	P	E	M	D	E	E	D
1486	D	P	E	M	D	D	E
1488	D	D	P	E	D	D	E
1490	D	D	P	E	D	D	E
1491	E	M	D	P	E	M	D
1494	D	E	M	D	E	E	E
1496	E	M	D	P	E	M	M
1497	D	P	E	M	D	P	E
1500	P	E	M	D	E	E	E
1502	D	D	D	D	D	D	E
1505	D	E	M	D	D	E	M
1507	D	P	E	M	D	P	E
1508	D	P	E	M	D	P	E
1511	E	M	M	M	D	P	P
1513	P	D	D	P	M	D	D
1514	E	M	D	E	D	D	D
1516	D	P	E	M	D	P	E
1517	D	D	D	E	D	D	E
1519	D	P	E	M	D	D	E
1521	D	P	E	M	D	P	E

Reviewed By: Russell A. Hoggan Date: 5/28/01

RT 01.14.00 EC1-04b

EXACT COPY
9/11/02

Argus

PROTOCOL: 418-020	Test Article/Substance: APFO		Type of Test: Estrous Cycle Evaluation
DOSAGE: 10.0 MKD	GENERATION: F1	ROUTE: Oral (Gavage)	Species/Strain: Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus
E = Estrus
M = Metestrus
D = Diestrus

Date	5.22.01	5.23.01	5.24.01	5.25.01	5.26.01	5.27.01	5.28.01
	1	2	3	4	5	6	7
ANIMAL NUMBER							
1523	D	P	E	M	D	P	E
1524	D	D	P	E	M	E	E
1527	D	~~E~~ P	E	M	D	P	E
1528	D	E	M	D	D	E	M
1531	E	D	D	P	E	E	D
1533	D	E	M	D	P	E	M
1534	D	D	P	E	D	D	P
1537	P	E	M	M	D	E	D
1539	E	M	D	D	D	P	E

5.23.01
Reviewed By: Russell A Gazzara

Date: 5/24/01

RT 01.14.00 EC1-04b

EXACT COPY
9/11/02

Argus

PROTOCOL: 418-020	Test Article/Substance: APFO		Type of Test: Estrous Cycle Evaluation
DOSAGE: 30.0 MKD	GENERATION: F1	ROUTE: Oral (Gavage)	Species/Strain: Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus
E = Estrus
M = Metestrus
D = Diestrus

Date	5.22.01	5.23.01	5.24.01	5.25.01	5.26.01	5.27.01	5.28.01
	1	2	3	4	5	6	7
ANIMAL NUMBER							
1541	E	M	D	D	E ~~D~~ ① SW 5.26.01	D	E
1544	D	D	E	M	D	D	E
1545	P	E	D	D	D	E	E
1546	D	D	E	M	D	P	E
1548	P	E	M	D	P	E	M
1550	D	D	P	E	D	D	E
1552	D	E	M	E	D	E	M
1555	D	D	E	M	D	P	E
1557	E	M	D	E	E	D	D
1558	D	D	D	E	D	D	E
1560	D	D	P	E	D	D	E
1564	P	E	M	D	P	E	E ~~D~~ ①
1565	E	M	D	E	E	M	D
1566	D	P	E	M	D	D	E
1568	P	E	M	D	P	E	M
1571	P	E	M	D	P	E	D
1573	E	D	E	D	E	D	D
1576	D	D	P	E	M	D	E
1578	D	D	E	M	D	P	E
1579	E	M	D	E	E	D	E
1583	D	P	E	M	D	D	E

Reviewed By: Russell A. Gazzara ① Ⓐ BM 5.28.01 Date: 5/28/01

RT 01.14.00 EC1-04b

EXACT COPY
JT 9/11/02

Argus

PROTOCOL:	Test Article/Substance:		Type of Test:
418-020	APFO		Estrous Cycle Evaluation
DOSAGE:	**GENERATION:**	**ROUTE:**	**Species/Strain:**
30.0 MKD	F1	Oral (Gavage)	Rat/Crl:CD® (SD) IGS BR VAF/Plus®

P = Proestrus
E = Estrus
M = Metestrus
D = Diestrus

Date	5-22-01	5-23-01	5-24-01	5-25-01	5-26-01	5-27-01	5-28-01
	1	2	3	4	5	6	7
ANIMAL NUMBER							
1584	M	D	E	M	D	D	E
1586	D	P	E	M	D	P	E
1587	E	E	M	D	P	E	E
1588	P	E	M	D	D	E	M
1589	E	D	D	D	D	P	D
1591	E	D	D	P	E	M	D
1593	D	D	P	E	M	D	D
1598	D	P	E	M	D	P	E
1600	D	P	E	M	D	P	E

Reviewed By: Russell A. Hoppa Date: 5/28/01

RT 01.14.00 EC1-04b

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9/11/02

AR226 - 1125

Estrous Cycling and Natural Delivery/Litter Observation Data

F1 Estrous Cycling Data, From Data Analysis Presented at EPA on August 30, 2002[a]

	APFO Dose Group (mg/kg/day)				
	0	1	3	10	30
All 4-Day Cycles	14/30	19/29	9/30	15/29	15/30
3-5 Day Cycles	24/30	26/29	21/30	25/29	27/30
Cycle Length (Days)	**Incidence of Cycle Length Per Group**				
2	1	0	5	2	5
3	2	1	7	5	5
4	75	80	57	84	86
5	18	16	32	14	17
6	5	2	5	3	0
7	1	1	0	0	0
8	2	0	1	0	2
Mean Cycle Length (Days) ± S.D.	4.3 ± 0.8	4.2 ± 0.5	4.3 ± 0.9	4.1 ± 0.6	4.1 ± 0.8
Aberrant Cycles[b]					
Parental					
≥ 4 Days Diest.	2	1	1	4	1
≥ 3 Days Est.	17	13	15	16	13
F1					
≥ 4 Days Diest.	5	3	3	5	3
≥ 3 Days Est.	25	25	29	11	14
Distribution of Cycle Status at Start of 21-Day Evaluation Period, F1					
P	1	4	1	2	5
E	8	10	11	14	11
M	6	2	2	0	2
D	15	13	16	13	12
Distribution Rats in Estrous at End of 21-Day Evaluation Period, F1					
End in Estrous	13	17	18	19	19
Mean Implantations, Liveborn, and Stillborn ± S.D. per Litter by Group[c]					
Parental Litters					
Implantations	15.3 ± 1.9	15.6 ± 2.1	15.2 ± 2.3	15.6 ± 2.0	15.3 ± 2.0
Liveborn	14.2 ± 2.2	14.2 ± 2.6	13.4 ± 3.6	13.8 ± 3.0	13.4 ± 3.3
Stillborn	0.1 ± 0.3	0.4 ± 1.4	0.2 ± 0.4	0.1 ± 0.4	0.2 ± 0.6
F1 Litters					
Implantations	14.8 ± 3.0	15.8 ± 2.1	14.7 ± 2.8	15.0 ± 2.9	14.5 ± 2.9
Liveborn	13.6 ± 2.9	13.7 ± 2.4	13.8 ± 3.0	13.5 ± 3.1	13.3 ± 2.8
Stillborn	0.2 ± 0.5	0.2 ± 0.5	0.2 ± 0.6	0.2 ± 0.5	0.1 ± 0.2

[a] Original analysis counted cycles from the day following estrous (or proestrous if diestrus followed proestrous without observation of estrous) to the day following the end of the next estrous. The numbers in this table have been reduced by one day to corespond to the new analysis presented in this submission, in which cycles were counted from the day following estrous to the last day of the next estrous.

2002 OCT -2 AM 8:59

[b] The definitions of aberrant cycles come from Daston, G. and Kimmel, C. (Eds), 1998. An Evaluation of Reproductive Endpoints for Human Health Risk Assessment. ILSI (November, 1998). Data presented is from evaluation of raw cycling data from ARGUS Research study 418-020, submitted with this table.

[c] This data was not discussed on August 30, 2002; however, it was agreed to represent these data in htis submission. The data are from Tables C19, C20, E20, and E21 of the final report on the APFO multi-generation reproduction/developmental study which has been previously submitted to AR-226.

Estrous Cycling and Natural Delivery/Litter Observation Data

F1 Estrous Cycling Data, From Data Analysis Presented at EPA on August 30, 2002[a]

	APFO Dose Group (mg/kg/day)				
	0	1	3	10	30
All 4-Day Cycles	14/30	19/29	9/30	15/29	15/30
3-5 Day Cycles	24/30	26/29	21/30	25/29	27/30
Cycle Length (Days)	**Incidence of Cycle Length Per Group**				
2	1	0	5	2	5
3	2	1	7	5	5
4	75	80	57	84	86
5	18	16	32	14	17
6	5	2	5	3	0
7	1	1	0	0	0
8	2	0	1	0	2
Mean Cycle Length (Days) ± S.D.	4.3 ± 0.8	4.2 ± 0.5	4.3 ± 0.9	4.1 ± 0.6	4.1 ± 0.8
Aberrant Cycles[b]					
Parental					
4 Days Diestrous	2	1	1	4	1
3 Days Estrous	17	13	15	16	13
F1					
4 Days Diestrous	5	3	3	5	3
3 Days Estrous	25	25	29	11	14
Distribution of Cycle Status at Start of 21-Day Evaluation Period, F1					
P	1	4	1	2	5
E	8	10	11	14	11
M	6	2	2	0	2
D	15	13	16	13	12
Distribution Rats in Estrous at End of 21-Day Evaluation Period, F1					
End in Estrous	13	17	18	19	19
Mean Implantations, Liveborn, and Stillborn ± S.D. per Litter by Group[c]					
Parental Litters					
Implantations	15.3 ± 1.9	15.6 ± 2.1	15.2 ± 2.3	15.6 ± 2.0	15.3 ± 2.0
Liveborn	14.2 ± 2.2	14.2 ± 2.6	13.4 ± 3.6	13.8 ± 3.0	13.4 ± 3.3
Stillborn	0.1 ± 0.3	0.4 ± 1.4	0.2 ± 0.4	0.1 ± 0.4	0.2 ± 0.6
F1 Litters					
Implantations	14.8 ± 3.0	15.8 ± 2.1	14.7 ± 2.8	15.0 ± 2.9	14.5 ± 2.9
Liveborn	13.6 ± 2.9	13.7 ± 2.4	13.8 ± 3.0	13.5 ± 3.1	13.3 ± 2.8
Stillborn	0.2 ± 0.5	0.2 ± 0.5	0.2 ± 0.6	0.2 ± 0.5	0.1 ± 0.2

[a] Original analysis counted cycles from the day following estrous (or proestrous if diestrus followed proestrous without observation of estrous) to the day following the end of the next estrous. The numbers

in this table have been reduced by one day to corespond to the new analysis presented in this submission, in which cycles were counted from the day following estrous to the last day of the next estrous.

[b] The definitions of aberrant cycles come from Daston, G. and Kimmel, C. (Eds), 1998. An Evaluation of Reproductive Endpoints for Human Health Risk Assessment. ILSI (November, 1998). Data presented is from evaluation of raw cycling data from ARGUS Research study 418-020, submitted with this table.

[c] This data was not discussed on August 30, 2002; however, it was agreed to represent these data in htis submission. The data are from Tables C19, C20, E20, and E21 of the final report on the APFO multi-generation reproduction/developmental study which has been previously submitted to AR-226.

AR 226_1126

P Generation

Group Summary

Group	NUMBER OF DAYS OF DATA COLLECTION	NUMBER OF DAYS IN ESTRUS	% OF DAYS IN ESTRUS	NUMBER OF DAYS IN DIESTRUS	% OF DAYS IN DIESTRUS	NUMBER OF DAYS IN PROESTRUS	% OF DAYS IN PROESTRUS	"N" FOR MEAN CYCLE LENGTH	MEAN CYCLE LENGTH	NUMBER OF CYCLES
Group I	21	9	43%	9	41%	3	16%	30	4.3	4.6
Group II	21	8	41%	9	45%	3	14%	30	4.0	4.6
Group III	21	9	42%	9	45%	3	13%	28	4.1	4.3
Group IV	21	8	39%	10	45%	3	15%	30	4.3	4.4
Group V	21	9	42%	9	43%	3	15%	29	4.1	4.6

2002 OCT -2 AM 8:59
OPPT NCIC

P Generation

Animal ID	Group	MEAN CYCLE LENGTH	NUMBER OF CYCLES
13801	1	3.75	5.00
13802	1	3.20	6.00
13803	1	3.75	5.00
13804	1	3.67	4.00
13805	1	3.75	5.00
13806	1	5.33	3.00
13807	1	4.00	5.00
13808	1	4.25	4.00
13809	1	4.25	5.00
13810	1	4.25	5.00
13811	1	4.50	4.00
13812	1	9.00	2.00
13813	1	4.00	5.00
13814	1	5.00	4.00
13815	1	5.00	4.00
13816	1	4.33	5.00
13817	1	4.00	5.00
13818	1	4.00	5.00
13819	1	4.00	5.00
13820	1	4.00	4.00
13821	1	4.25	5.00
13822	1	4.00	5.00
13823	1	4.00	5.00
13824	1	3.40	6.00
13825	1	4.67	5.00
13826	1	3.75	5.00
13827	1	4.25	5.00
13828	1	3.75	4.00
13829	1	4.00	4.00
13830	1	4.00	5.00
13831	2	3.67	5.00
13832	2	4.25	5.00
13833	2	4.00	5.00
13834	2	3.75	5.00
13835	2	4.00	5.00
13836	2	4.00	2.00
13837	2	4.00	5.00
13838	2	4.50	2.00
13839	2	3.75	5.00
13840	2	4.33	5.00
13841	2	3.75	4.00
13842	2	4.00	4.00
13843	2	4.25	5.00
13844	2	3.75	4.00
13845	2	4.00	4.00
13846	2	4.00	5.00
13847	2	4.00	4.00
13848	2	4.00	5.00

P Generation

13849	2	4.00	5.00
13850	2	4.25	6.00
13851	2	3.25	6.00
13852	2	3.75	5.00
13853	2	4.00	4.00
13854	2	4.00	5.00
13855	2	3.75	5.00
13856	2	3.75	4.00
13857	2	4.50	4.00
13858	2	4.00	5.00
13859	2	3.80	5.00
13860	2	4.25	5.00
13861	3	5.00	3.00
13862	3	3.75	5.00
13863	3	4.00	5.00
13864	3	4.67	4.00
13865	3	4.00	4.00
13866	3	4.67	3.00
13867	3	4.00	5.00
13868	3	3.75	5.00
13869	3	4.00	5.00
13870	3	4.00	4.00
13871	3	3.75	5.00
13872	3	3.75	5.00
13873	3	4.00	5.00
13874	3	5.00	3.00
13875	3	4.00	4.00
13876	3	3.75	4.00
13877	3	4.25	4.00
13878	3	4.25	5.00
13879	3	4.00	6.00
13880	3	4.00	4.00
13881	3	5.00	4.00
13882	3	4.00	5.00
13883	3	3.75	5.00
13884	3	4.00	5.00
13885	3	#DIV/0!	FALSE
13886	3	#DIV/0!	1.00
13887	3	4.00	5.00
13888	3	4.00	4.00
13889	3	3.75	4.00
13890	3	4.00	5.00
13891	4	4.00	5.00
13892	4	4.25	5.00
13893	4	3.75	5.00
13894	4	3.75	5.00
13895	4	4.00	5.00
13896	4	4.50	4.00
13897	4	4.00	5.00
13898	4	3.75	4.00
13899	4	4.00	5.00

P Generation

13900	4	6.00	3.00
13901	4	4.00	5.00
13902	4	4.00	5.00
13903	4	4.00	5.00
13904	4	4.00	2.00
13905	4	5.33	4.00
13906	4	4.25	5.00
13907	4	5.33	3.00
13908	4	4.00	4.00
13909	4	4.25	5.00
13910	4	5.33	4.00
13911	4	4.00	4.00
13912	4	4.25	5.00
13913	4	4.75	4.00
13914	4	5.33	4.00
13915	4	4.25	5.00
13916	4	4.00	5.00
13917	4	5.33	3.00
13918	4	4.00	5.00
13919	4	4.00	5.00
13920	4	3.75	5.00
13921	5	4.00	5.00
13922	5	4.00	5.00
13923	5	4.00	4.00
13924	5	3.60	5.00
13925	5	4.00	5.00
13926	5	3.75	5.00
13927	5	3.75	5.00
13928	5	3.75	4.00
13929	5	#DIV/0!	1.00
13930	5	3.75	5.00
13931	5	4.25	5.00
13932	5	3.75	5.00
13933	5	4.00	5.00
13934	5	4.25	5.00
13935	5	5.33	3.00
13936	5	3.75	5.00
13937	5	4.00	5.00
13938	5	4.33	4.00
13939	5	4.00	5.00
13940	5	5.33	4.00
13941	5	4.00	5.00
13942	5	4.00	4.00
13943	5	4.25	4.00
13944	5	4.00	5.00
13945	5	4.25	5.00
13946	5	3.75	5.00
13947	5	4.67	5.00
13948	5	3.67	5.00
13949	5	5.00	4.00
13950	5	4.25	5.00

P1 estrous cycle data
Group I

P1 Generation - 0 MKD																					
	1/1	1/2	1/3	1/4	1/5	1/6	1/7	1/8	1/9	1/10	1/11	1/12	1/13	1/14	1/15	1/16	1/17	1/18	1/19	1/20	1/21
Animal / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
13801	D	D	D	E	E	D	P	E	E	D	P	E	E	D	P	E	D	D	E	E	D
13802	D	D	E	D	D	E	E	D	E	D	E	D	D	P	E	D	D	D	E	D	P
13803	E	D	P	E	E	D	P	E	D	D	P	E	D	D	P	E	D	D	D	E	E
13804	E	E	E	D	P	E	E	D	P	E	E	D	P	E	D	D	P	E			
13805	D	E	E	D	P	E	E	D	E	E	E	D	E	E	D	D	P	E	D	P	D
13806	E	E	D	D	P	E	D	D	P	D	D	D	E	E	D	D	P	E	D	D	P
13807	D	D	E	D	D	P	E	D	D	P	E	E	D	P	E	E	D	P	E	D	D
13808	E	E	D	D	E	E	E	D	P	E	D	D	E	E	E	D	P	E	E	D	P
13809	E	D	D	P	E	D	D	P	E	E	D	P	E	E	D	P	E	E	D	P	E
13810	P	D	E	D	D	E	E	D	D	P	E	D	D	D	E	D	D	D	E	E	D
13811	D	E	E	D	D	E	E	E	D	D	E	E	D	D	D	D	D	D	D	P	E
13812	E	E	D	D	P	E	D	D	D	D	D	D	D	D	D	D	D	D	D	E	D
13813	E	E	D	P	E	E	D	P	E	E	D	P	E	E	D	E	E	E	D	P	E
13814	D	D	P	E	E	D	P	E	E	E	D	D	E	E	E	D	D	P	E	E	D
13815	E	E	D	P	E	E	E	D	P	E	E	D	D	D	E	E	E	D	D	P	E
13816	D	D	E	E	D	E	E	E	D	P	E	E	D	D	P	E	E	D	D	P	E
13817	E	D	P	E	E	E	D	E	D	D	P	E	D	D	E	E	E	D	E	E	E
13818	D	P	E	E	E	D	E	E	E	D	D	E	P	D	P	E	E	D	P	E	E
13819	D	P	E	D	D	E	E	D	D	P	E	E	D	P	E	E	D	E	E	D	D
13820	P	E	E	D	P	E	E	E	P	E	E	E	P	E	E	D	D	E	E	D	D
13821	E	D	D	P	E	D	D	P	E	D	D	E	E	E	D	D	E	E	D	P	E
13822	E	E	D	P	E	E	D	P	E	D	D	P	E	D	D	P	E	E	D	P	E
13823	E	E	D	P	E	E	D	P	E	E	D	D	E	D	D	P	E	E	D	P	E
13824	E	D	D	D	E	E	D	P	E	E	D	E	E	D	E	D	E	E	D	E	E
13825	D	E	D	E	D	P	P	D	D	D	P	E	D	D	E	E	D	D	P	E	E
13826	P	E	E	D	P	E	E	D	P	E	D	D	D	E	D	D	D	E	D	P	E
13827	E	D	D	P	E	E	D	P	E	D	D	P	E	D	D	E	E	E	D	P	E
13828	P	E	E	D	P	E	E	D	P	E	E	D	D	E	E	D	P	E	D	D	P
13829	E	E	D	D	P	E	E	D	P	E	E	D	P	E	D	D	P	E	D	D	P
13830	E	D	D	P	E	D	D	P	E	D	D	D	E	E	D	D	E	D	D	P	E

P1 estrous cycle data
Group II

P1 Generation - 1 MKD																					
	1/1	1/2	1/3	1/4	1/5	1/6	1/7	1/8	1/9	1/10	1/11	1/12	1/13	1/14	1/15	1/16	1/17	1/18	1/19	1/20	1/21
Animal / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
13831	D	D	E	E	E	D	E	E	D	D	E	E	D	D	D	E	D	D	D	E	E
13832	E	D	D	D	E	E	D	D	E	E	D	D	E	D	D	D	E	E	D	D	E
13833	D	P	E	E	D	P	E	E	D	P	E	D	D	P	E	D	D	P	E	E	D
13834	D	P	E	E	D	P	E	E	D	P	E	D	D	P	E	E	D	P	E	D	D
13835	D	E	E	D	D	P	E	D	D	P	E	D	D	P	E	D	D	P	E	D	D
13836	P	E	D	D	P	E	E	D	P	E	X										
13837	E	E	D	D	D	E	E	D	P	E	E	D	E	E	D	D	P	E	D	D	E
13838	P	E	D	D	D	E	E	D	D	P	E	D	D	D	P	P	D	D	D	D	D
13839	D	P	E	E	D	P	E	E	D	P	E	E	D	D	E	D	D	P	E	D	D
13840	D	P	E	E	D	E	E	E	E	D	D	E	E	E	D	P	E	D	D	D	E
13841	E	E	E	D	D	E	D	D	P	E	E	D	D	E	D	D	E	E	D	D	D
13842	E	E	D	D	P	E	D	D	P	E	D	D	D	E	D	D	P	E	D	D	D
13843	E	D	D	P	E	D	D	E	E	E	D	P	E	E	D	P	E	E	D	P	E
13844	P	E	E	D	P	E	E	D	E	E	D	D	E	E	E	D	P	E	D	D	P
13845	E	E	D	D	P	E	D	D	P	E	E	D	D	E	E	D	P	E	D	D	P
13846	E	D	E	D	D	D	E	E	D	P	E	E	D	D	E	E	E	D	D	E	E
13847	P	E	D	D	P	E	D	D	D	E	D	D	E	E	D	D	P	E	D	D	P
13848	E	D	D	E	E	E	D	D	E	E	P	P	E	D	D	D	E	D	D	E	E
13849	D	D	P	E	E	D	P	E	D	P	E	E	D	D	P	E	E	D	P	E	E
13850	D	E	D	D	D	E	D	D	P	E	E	D	D	E	D	D	P	E	E	D	E
13851	D	D	E	E	D	E	P	E	E	D	D	E	E	D	D	E	E	D	D	D	E
13852	D	E	E	D	D	E	D	D	P	E	E	D	D	E	E	D	P	E	D	D	P
13853	P	E	D	D	P	E	E	D	P	E	E	D	D	E	E	D	P	E	D	D	P
13854	D	E	D	D	D	E	D	D	P	E	E	D	D	E	D	D	P	E	D	D	P
13855	D	E	E	D	P	E	D	D	P	E	D	D	D	E	D	D	P	E	D	D	P
13856	P	E	E	D	P	E	E	D	P	E	E	D	D	E	E	D	P	E	D	D	P
13857	D	D	D	E	E	D	E	E	E	D	E	E	E	E	D	D	E	E	E	E	E
13858	D	E	D	D	D	E	D	D	D	E	D	D	D	E	D	D	D	E	D	D	D
13859	E	D	E	E	E	D	P	E	D	D	E	E	E	D	P	E	E	D	P	E	D
13860	E	D	D	P	E	E	D	P	E	D	D	P	E	E	D	P	E	E	D	P	E

P1 estrous cycle data
Group III

P1 Generation - 3 MKD																					
	1/1	1/2	1/3	1/4	1/5	1/6	1/7	1/8	1/9	1/10	1/11	1/12	1/13	1/14	1/15	1/16	1/17	1/18	1/19	1/20	1/21
Animal / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
13861	E	E	D	D	D	P	E	D	D	P	E	E	D	D	D	E	E	D	D	D	P
13862	E	E	D	P	E	D	D	P	E	D	D	P	E	D	D	P	E	D	D	P	E
13863	D	E	E	D	D	P	E	D	D	E	E	D	D	D	E	D	D	P	E	D	D
13864	E	E	E	D	D	P	E	D	D	P	E	E	D	D	E	E	E	D	D	E	E
13865	P	E	D	D	P	E	E	D	P	E	E	D	D	E	E	D	P	E	D	D	P
13866	E	E	E	D	D	E	E	D	D	P	E	E	D	D	D	E	E	D	D	D	D
13867	D	D	P	P	E	E	D	D	E	D	D	D	E	D	D	D	E	E	D	P	E
13868	E	E	D	P	E	E	D	P	E	E	D	P	E	E	D	P	E	D	D	P	E
13869	E	D	D	D	E	E	D	D	E	E	D	D	E	E	P	D	E	D	D	D	E
13870	P	E	D	D	P	E	D	D	P	E	E	D	P	E	D	D	P	E	D	D	P
13871	D	P	E	E	D	P	E	E	D	P	E	E	D	P	E	D	D	P	E	D	D
13872	E	E	D	D	E	D	D	D	E	D	D	D	E	D	D	D	E	D	D	D	E
13873	E	D	D	P	E	D	D	D	E	D	D	D	E	D	D	P	E	D	D	P	E
13874	P	E	E	D	D	D	E	E	D	D	P	E	E	D	D	P	E	E	D	D	P
13875	P	E	D	D	E	E	D	D	P	E	E	D	D	E	E	D	P	E	D	D	D
13876	E	E	E	D	D	E	D	D	P	E	D	D	D	E	E	D	P	E	D	D	P
13877	E	E	D	D	E	E	D	P	E	D	D	P	E	E	E	D	D	E	E	D	D
13878	E	D	P	E	D	D	E	E	E	D	P	E	D	D	P	E	E	E	D	P	E
13879	D	E	D	D	D	E	E	D	D	E	E	D	D	E	D	D	D	E	D	D	E
13880	E	E	D	D	D	E	E	D	D	P	E	D	D	E	D	D	P	E	D	D	P
13881	P	E	D	D	P	E	E	E	D	P	E	E	D	D	E	E	E	D	D	P	E
13882	E	D	E	E	E	D	P	E	E	D	E	E	D	D	E	E	E	D	P	E	E
13883	D	E	E	D	D	E	D	D	D	E	D	D	D	E	E	D	D	E	D	D	D
13884	E	D	P	E	E	D	P	E	D	D	D	D	E	D	D	P	E	D	D	D	E
13885	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
13886	E	D	D	P	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
13887	E	D	D	P	E	D	D	P	E	E	D	P	E	D	D	P	E	D	D	P	E
13888	E	E	D	D	D	E	D	D	P	E	D	D	D	E	D	D	D	E	D	D	P
13889	E	E	E	D	P	E	D	D	D	E	D	D	E	E	E	D	D	E	D	D	P
13890	E	D	D	P	E	D	P	E	E	D	D	D	E	E	D	D	E	D	D	D	E

P1 estrous cycle data
Group IV

P1 Generation - 10 MKD																					
	1/1	1/2	1/3	1/4	1/5	1/6	1/7	1/8	1/9	1/10	1/11	1/12	1/13	1/14	1/15	1/16	1/17	1/18	1/19	1/20	1/21
Animal / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
13891	E	E	D	P	E	D	D	P	E	E	D	P	E	D	D	D	E	E	D	D	E
13892	E	D	D	P	E	D	D	P	E	D	D	P	E	E	D	D	E	E	D	P	E
13893	D	E	E	D	D	E	D	D	D	E	D	D	D	E	D	D	D	E	D	D	P
13894	D	D	E	E	D	P	E	D	D	D	E	D	D	D	E	D	D	D	E	D	D
13895	D	E	E	E	D	D	E	E	D	E	E	E	D	D	E	E	D	P	E	E	D
13896	E	D	D	E	E	D	D	D	E	D	P	D	D	P	E	D	D	D	E	D	D
13897	E	D	D	D	E	D	D	E	E	D	D	E	E	D	D	D	E	D	D	D	E
13898	P	E	E	D	P	E	D	D	P	E	E	D	D	E	E	D	P	E	D	D	P
13899	D	P	E	E	D	P	E	D	D	P	E	E	D	D	P	E	D	D	D	E	D
13900	D	P	E	E	E	E	P	P	E	E	E	E	D	E	E	E	E	E	E	E	E
13901	E	D	P	E	E	P	P	E	D	D	E	E	D	D	E	E	E	D	D	P	E
13902	D	P	E	D	D	P	E	E	D	P	E	E	D	P	E	D	D	P	E	D	P
13903	E	D	P	E	D	D	P	E	D	D	P	E	E	D	P	E	E	D	P	E	E
13904	E	D	E	E	D	P	D	E	E	D	D	D	P	D	D	D	D	P	P	D	D
13905	D	P	E	E	D	D	P	E	E	E	D	D	P	E	E	D	D	P	E	E	D
13906	E	D	D	D	E	D	P	D	E	E	D	D	E	D	D	D	E	E	D	P	E
13907	E	E	D	D	D	P	D	P	E	E	D	D	D	E	E	D	P	E	D	D	P
13908	P	E	E	D	P	E	D	D	P	E	D	D	E	E	D	D	P	E	E	D	P
13909	E	D	D	P	E	D	D	P	E	D	D	P	E	D	P	P	E	E	D	P	E
13910	D	P	E	D	D	D	E	E	D	D	P	E	D	D	D	D	E	E	E	D	D
13911	E	E	D	D	E	D	P	D	E	D	D	D	D	E	E	D	D	E	D	D	D
13912	D	E	D	D	D	E	D	D	D	E	D	D	D	E	E	D	D	P	E	D	D
13913	E	D	P	E	D	D	P	E	D	D	D	D	D	D	E	E	E	D	D	E	D
13914	D	D	E	E	D	P	P	D	E	D	D	P	E	E	E	D	P	P	E	E	D
13915	E	D	D	P	E	D	D	P	E	D	D	P	E	E	D	P	E	E	D	P	E
13916	D	D	E	E	E	D	P	E	E	D	E	E	D	D	D	E	E	D	P	E	E
13917	E	E	E	D	P	P	D	D	P	E	E	D	P	E	E	D	D	D	E	D	P
13918	E	D	D	P	E	D	P	P	E	D	D	P	E	D	D	P	E	D	D	P	E
13919	E	D	P	E	E	D	P	E	D	D	D	E	E	D	E	E	E	D	P	E	E
13920	D	D	D	E	E	P	E	E	E	D	E	E	E	D	E	E	E	D	D	E	D

P1 estrous cycle data
Group V

P1 Generation - 30 MKD																					
	1/1	1/2	1/3	1/4	1/5	1/6	1/7	1/8	1/9	1/10	1/11	1/12	1/13	1/14	1/15	1/16	1/17	1/18	1/19	1/20	1/21
Animal / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
13921	D	D	E	D	D	P	E	D	D	D	E	D	D	P	E	D	D	P	E	D	D
13922	D	D	E	D	D	D	E	D	D	D	E	D	D	P	E	D	D	P	E	D	D
13923	E	E	D	D	P	E	E	D	P	E	D	D	P	E	D	D	P	E	D	D	P
13924	P	E	D	D	P	E	E	D	P	E	E	D	P	E	E	D	P	E	D	E	P
13925	E	E	D	P	E	E	D	P	E	E	E	P	E	D	D	P	E	E	D	P	E
13926	D	D	E	E	D	P	E	E	D	P	E	E	D	D	E	E	D	P	E	D	P
13927	D	P	E	E	D	P	E	E	D	P	E	E	D	P	E	D	D	P	E	D	P
13928	P	E	E	D	D	E	D	D	D	E	E	D	D	E	E	D	P	E	D	D	P
13929	D	D	P	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
13930	D	P	E	E	D	P	E	D	D	P	E	E	D	D	E	E	D	P	E	D	P
13931	E	D	D	D	E	D	D	P	E	E	D	P	E	D	D	P	E	E	D	P	E
13932	D	D	P	E	E	D	D	E	D	D	D	E	E	D	P	E	D	D	D	E	D
13933	D	E	E	E	E	E	P	E	E	D	E	E	E	E	D	P	E	E	D	E	E
13934	E	D	D	E	E	E	D	P	E	D	D	E	E	D	D	P	E	E	D	P	E
13935	E	E	E	D	D	P	E	D	D	E	E	E	D	D	E	E	E	E	E	D	D
13936	E	E	D	D	E	D	P	P	E	D	D	D	E	D	D	D	E	D	D	D	E
13937	D	D	E	E	D	P	P	E	D	D	D	E	D	D	E	E	D	P	D	E	E
13938	D	E	E	D	D	P	E	D	D	P	E	D	D	P	E	E	D	P	P	D	D
13939	D	E	E	D	D	P	E	D	D	D	E	D	D	D	E	E	D	P	E	D	D
13940	E	D	D	D	E	E	D	D	P	P	E	E	D	D	E	E	E	D	P	E	E
13941	D	E	D	D	D	E	D	D	D	E	E	D	P	E	E	D	P	E	D	D	P
13942	P	E	D	D	P	E	D	D	P	E	E	D	D	E	E	D	P	E	D	D	P
13943	E	D	D	D	E	D	D	D	D	E	D	D	D	E	D	D	D	E	D	D	D
13944	D	P	E	E	D	D	E	E	D	P	E	E	D	P	E	E	D	P	E	E	D
13945	D	E	E	D	D	P	E	E	D	E	E	D	D	D	E	E	D	D	E	E	D
13946	E	E	D	P	E	D	P	P	E	E	D	P	E	D	D	D	E	D	D	E	E
13947	D	E	E	D	D	D	E	E	D	D	E	E	D	D	P	E	E	D	D	P	E
13948	D	D	D	E	E	E	D	E	E	E	D	D	E	D	D	D	E	D	D	D	E
13949	E	D	E	E	E	P	P	E	E	E	E	E	D	D	D	E	D	D	P	E	E
13950	E	D	D	P	E	E	P	E	E	D	D	P	E	E	D	D	E	E	D	D	E

F1 Generation

Group	NUMBER OF DAYS OF DATA COLLECTION	NUMBER OF DAYS IN ESTRUS	% OF DAYS IN ESTRUS	NUMBER OF DAYS IN DIESTRUS	% OF DAYS IN DIESTRUS	NUMBER OF DAYS IN PROESTRUS	% OF DAYS IN PROESTRUS	"N" FOR MEAN CYCLE LENGTH	MEAN CYCLE LENGTH	NUMBER OF CYCLES
Group I	21	9	44%	9	41%	3	15%	30	4.9	4.4
Group II	21	9	43%	9	41%	3	16%	29	4.5	4.6
Group III	21	9	44%	9	43%	3	13%	30	4.5	4.7
Group IV	21	8	39%	10	45%	3	16%	29	4.6	4.6
Group V	21	9	42%	9	43%	3	15%	30	4.3	4.8

F1 Generation

Animal ID	Group	MEAN CYCLE LENGTH	NUMBER OF CYCLES
1302	1	4.25	5.00
1304	1	4.00	5.00
1306	1	4.25	5.00
1308	1	3.80	5.00
1310	1	4.00	5.00
1312	1	5.00	3.00
1313	1	4.25	5.00
1316	1	4.33	5.00
1318	1	6.33	3.00
1321	1	4.50	4.00
1325	1	4.00	4.00
1328	1	4.25	5.00
1330	1	4.00	5.00
1331	1	4.50	3.00
1334	1	5.00	4.00
1335	1	4.00	5.00
1336	1	4.33	5.00
1338	1	4.25	5.00
1340	1	16.00	2.00
1341	1	5.33	5.00
1342	1	5.00	4.00
1344	1	4.67	5.00
1345	1	5.67	3.00
1346	1	5.00	5.00
1348	1	4.25	4.00
1350	1	4.33	4.00
1353	1	5.50	4.00
1355	1	3.75	5.00
1358	1	4.33	5.00
1359	1	5.50	4.00
1362	2	4.25	5.00
1363	2	4.00	5.00
1364	2	3.75	5.00
1367	2	4.25	5.00
1368	2	3.80	5.00
1371	2	4.33	5.00
1375	2	4.00	6.00
1376	2	5.33	4.00
1378	2	4.00	5.00
1379	2	4.25	5.00
1381	2	4.25	5.00
1382	2	4.00	5.00
1383	2	8.00	3.00
1384	2	4.00	5.00
1387	2	5.00	5.00
1389	2	4.00	4.00
1392	2	4.00	4.00
1393	2	4.75	4.00

F1 Generation

1397	2	4.25	5.00
1399	2	4.00	5.00
1401	2	4.33	5.00
1404	2	5.00	4.00
1407	2	4.33	5.00
1409	2	5.00	4.00
1410	2	5.00	4.00
1413	2	4.25	5.00
1415	2	5.00	3.00
1416	2	4.25	4.00
1418	2	4.33	5.00
1421	3	4.25	6.00
1424	3	4.50	4.00
1426	3	5.33	4.00
1428	3	4.67	5.00
1430	3	4.25	5.00
1431	3	4.00	4.00
1433	3	3.50	5.00
1436	3	4.25	5.00
1437	3	3.75	5.00
1439	3	4.00	5.00
1442	3	5.33	4.00
1443	3	4.67	4.00
1446	3	5.00	4.00
1448	3	4.00	5.00
1450	3	4.00	5.00
1452	3	4.25	6.00
1455	3	4.25	5.00
1456	3	6.50	3.00
1458	3	3.50	5.00
1459	3	4.33	4.00
1461	3	3.40	6.00
1463	3	4.25	5.00
1465	3	3.50	5.00
1468	3	4.25	5.00
1469	3	7.50	4.00
1472	3	4.67	4.00
1474	3	4.25	5.00
1476	3	4.00	5.00
1477	3	4.25	5.00
1480	3	5.33	4.00
1482	4	4.25	5.00
1483	4	4.25	5.00
1486	4	4.67	5.00
1488	4	5.67	4.00
1490	4	3.20	6.00
1491	4	4.25	5.00
1494	4	5.00	5.00
1496	4	4.33	5.00
1497	4	4.25	5.00
1500	4	4.67	5.00

F1 Generation

1502	4	#DIV/0!	2.00
1505	4	4.33	5.00
1507	4	4.25	5.00
1508	4	4.00	5.00
1511	4	8.50	2.00
1513	4	5.33	4.00
1514	4	3.75	4.00
1516	4	4.25	5.00
1517	4	4.00	5.00
1519	4	4.67	5.00
1521	4	4.25	5.00
1523	4	4.25	5.00
1524	4	4.00	4.00
1527	4	5.33	4.00
1528	4	4.33	5.00
1531	4	5.00	4.00
1533	4	4.00	5.00
1534	4	4.00	5.00
1537	4	4.00	5.00
1539	4	7.50	3.00
1541	5	3.75	6.00
1544	5	4.00	5.00
1545	5	3.75	5.00
1546	5	4.25	5.00
1548	5	4.00	5.00
1550	5	3.75	6.00
1552	5	4.25	5.00
1555	5	4.25	5.00
1557	5	4.00	5.00
1558	5	4.25	5.00
1560	5	4.00	5.00
1564	5	4.33	5.00
1565	5	4.25	5.00
1566	5	5.67	4.00
1568	5	4.00	5.00
1571	5	4.00	5.00
1573	5	4.25	4.00
1576	5	4.33	5.00
1578	5	4.25	5.00
1579	5	4.00	6.00
1583	5	5.00	4.00
1584	5	3.75	5.00
1586	5	4.25	5.00
1587	5	5.33	4.00
1588	5	4.67	5.00
1589	5	4.33	3.00
1591	5	5.67	4.00
1593	5	4.25	4.00
1598	5	4.33	5.00
1600	5	4.25	5.00

F1 estrous cycle data
Group I

F1 Generation - 0 MKD																					
	5/8	5/9	5/10	5/11	5/12	5/13	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26	5/27	5/28
Animal / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1302	E	D	D	P	E	D	D	P	E	E	D	D	E	D	D	P	E	E	D	P	E
1304	D	P	E	D	D	P	E	D	D	E	E	D	D	P	E	E	D	P	E	D	D
1306	E	D	D	P	E	E	D	P	E	E	D	P	E	D	D	P	E	E	D	P	E
1308	E	D	E	E	D	E	E	E	D	D	E	E	D	D	E	E	E	D	E	E	D
1310	E	D	P	E	D	P	P	E	D	D	P	E	D	D	P	E	E	D	D	E	E
1312	E	E	E	D	P	E	E	E	D	D	P	E	D	D	D	P	E	E	D	D	P
1313	D	E	D	D	P	E	E	D	P	E	E	D	P	E	D	D	D	P	E	D	D
1316	D	P	E	E	E	D	D	E	E	E	D	D	E	D	D	P	E	E	D	D	E
1318	E	D	P	D	D	D	D	P	E	E	D	D	D	E	D	D	D	D	E	E	D
1321	D	D	P	P	D	D	P	E	D	D	P	E	D	D	P	E	E	D	D	E	E
1325	E	E	D	D	P	E	E	D	E	E	D	D	P	E	D	D	P	E	E	E	E
1328	E	D	D	P	E	E	D	P	E	E	D	D	E	E	D	P	E	E	D	E	E
1330	E	D	P	E	D	D	P	E	D	D	E	E	E	D	D	E	E	D	E	E	E
1331	D	D	D	D	P	D	D	E	E	E	E	D	D	P	E	E	D	D	E	E	D
1334	D	P	E	E	D	P	E	E	E	E	E	D	D	P	E	E	D	P	E	D	D
1335	E	D	P	E	D	D	P	E	E	D	P	E	E	D	P	E	E	D	P	E	E
1336	D	D	P	E	P	D	P	E	E	D	P	E	E	D	P	E	E	D	D	E	E
1338	D	E	E	D	D	P	E	E	D	P	E	D	D	P	E	E	D	P	E	E	D
1340	E	D	D	D	P	D	D	D	D	D	D	D	D	D	E	E	E	D	E	E	E
1341	D	E	E	D	D	P	E	D	D	P	E	D	D	P	D	D	D	E	E	D	E
1342	D	E	E	D	D	P	E	E	D	D	P	E	E	D	D	P	E	E	D	D	P
1344	D	P	E	D	D	D	E	E	E	D	D	E	E	D	D	E	E	D	D	P	E
1345	E	E	D	D	P	E	E	E	E	E	D	D	P	E	D	D	E	E	E	D	D
1346	D	D	P	E	D	D	E	E	P	E	D	E	E	E	E	E	E	E	E	P	E
1348	P	E	D	D	P	E	E	D	P	E	E	D	P	E	E	D	P	E	E	D	P
1350	E	E	D	D	D	E	E	D	D	E	E	D	D	P	E	D	D	P	E	E	E
1353	D	D	D	D	P	E	D	D	P	E	E	D	D	P	E	E	E	D	D	E	E
1355	E	D	P	E	D	D	D	E	E	D	E	E	E	D	D	E	D	D	E	E	E
1358	D	P	E	E	D	D	D	E	D	D	P	E	D	D	P	E	E	D	E	E	E
1359	D	D	D	E	E	E	D	D	E	E	E	D	D	P	E	E	E	D	D	E	E

F1 estrous cycle data
Group II

F1 Generation - 1 MKD																					
	5/8	5/9	5/10	5/11	5/12	5/13	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26	5/27	5/28
Animal / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1362	E	D	D	E	E	E	D	E	E	E	D	E	E	D	D	D	E	E	D	D	E
1363	D	D	P	E	D	D	P	E	E	E	D	E	D	D	D	E	E	D	E	E	D
1364	D	D	P	E	E	D	P	E	E	D	E	E	D	D	P	E	E	D	E	E	D
1367	E	D	D	P	E	E	D	P	E	D	D	P	E	D	D	P	E	E	D	P	E
1368	E	D	P	E	D	D	P	E	E	D	P	E	D	D	P	E	E	D	E	E	D
1371	D	D	D	E	E	D	D	P	E	E	D	P	E	D	D	P	E	E	D	D	E
1375	D	P	E	D	D	P	E	D	D	E	E	D	D	E	E	D	D	D	E	D	E
1376	E	D	D	D	P	E	E	D	P	E	E	D	D	P	E	E	E	D	P	E	E
1378	E	D	D	D	E	D	D	D	E	E	E	D	P	E	D	D	E	D	D	D	E
1379	E	D	D	P	E	D	D	P	E	D	D	P	E	D	D	P	E	E	D	D	E
1381	E	D	D	P	E	D	D	E	E	E	D	D	E	D	D	D	E	E	D	D	E
1382	D	D	E	E	D	D	P	E	E	E	D	E	E	D	P	E	E	D	E	E	D
1383	E	E	E	D	D	P	E	E	D	D	D	D	D	P	D	D	D	D	E	P	E
1384	D	P	E	D	D	E	E	D	D	E	E	D	D	P	E	E	D	P	E	D	D
1387	P	D	E	E	D	D	P	E	E	E	D	P	E	E	E	D	P	E	E	D	E
1389	D	D	D	D	D	P	P	E	D	P	E	D	D	E	E	E	D	P	E	E	E
1392	E	D	D	P	E	E	D	P	E	E	D	P	E	D	D	P	E	E	E	E	E
1393	E	D	D	P	E	E	D	D	E	E	E	D	D	P	E	E	D	D	E	E	D
1397	D	P	E	D	D	P	E	D	D	D	E	D	D	E	E	E	D	P	E	E	D
1399	E	D	P	E	E	D	P	E	E	D	P	E	E	D	P	E	E	D	D	E	E
1401	D	P	E	D	D	P	E	E	D	P	E	E	D	P	E	E	D	P	E	E	E
1404	P	E	E	D	P	E	E	E	D	P	E	E	E	D	P	E	E	E	D	D	E
1407	D	D	P	E	D	D	P	E	E	D	D	E	D	D	P	E	E	D	P	E	E
1409	D	D	P	E	D	D	P	E	E	D	D	D	P	E	D	D	D	P	E	D	D
1410	D	E	E	E	D	D	P	E	E	D	D	P	E	E	E	D	D	P	E	D	D
1413	E	D	D	P	E	D	D	P	E	D	D	P	E	D	D	D	E	E	D	D	E
1415	P	E	E	D	D	P	E	D	D	E	E	E	E	D	D	E	E	E	D	D	P
1416	P	E	D	D	P	E	E	D	P	E	D	P	E	E	E	D	P	E	E	D	P
1418	D	P	E	D	D	P	E	E	D	P	E	D	D	P	E	E	D	P	E	E	E

F1 estrous cycle data
Group III

F1 Generation - 3 MKD																					
	5/8	5/9	5/10	5/11	5/12	5/13	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26	5/27	5/28
Animal / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1421	D	E	D	D	E	E	E	D	P	E	D	D	D	E	D	D	E	E	E	D	E
1424	E	D	P	E	E	E	D	E	E	D	D	D	E	E	D	D	D	E	E	D	D
1426	E	E	E	D	D	E	E	E	D	D	E	E	D	D	D	E	E	E	E	D	E
1428	D	D	D	E	E	D	D	P	E	P	D	E	E	E	D	D	D	P	E	D	E
1430	D	P	E	D	D	P	E	E	D	E	E	E	D	P	E	E	D	P	E	E	D
1431	P	E	E	D	P	E	E	D	P	D	E	D	P	E	D	D	P	E	E	D	P
1433	D	D	P	E	E	E	D	E	E	D	P	E	D	D	P	E	E	D	D	E	D
1436	E	D	D	E	E	E	D	E	E	E	D	E	E	D	D	E	E	E	D	D	E
1437	E	D	D	P	E	D	D	P	E	D	D	E	P	E	E	E	D	P	D	E	E
1439	E	D	E	P	D	D	E	E	E	P	P	E	D	D	P	E	E	D	P	E	E
1442	E	D	D	D	D	P	E	E	D	E	E	E	D	D	D	E	E	D	D	D	E
1443	D	D	D	E	E	D	D	D	E	E	D	D	D	P	E	E	D	E	E	D	D
1446	D	D	D	D	D	P	E	D	P	P	E	D	D	P	E	E	E	D	P	E	E
1448	D	P	E	E	D	P	E	D	D	P	E	E	D	P	D	E	D	P	E	E	D
1450	D	D	D	E	D	D	D	E	E	D	D	E	E	D	D	E	E	D	E	E	D
1452	D	E	D	D	P	D	D	D	P	E	D	D	D	E	D	E	D	P	E	D	E
1455	E	D	D	P	E	D	D	E	E	D	D	D	E	D	D	E	E	E	D	P	E
1456	E	D	D	P	E	E	E	E	E	E	D	D	P	E	D	D	P	E	E	E	E
1458	D	D	E	E	D	E	D	E	E	D	D	P	E	E	D	D	E	E	D	D	P
1459	D	D	D	P	E	D	D	D	E	E	D	D	E	E	D	D	E	E	D	D	D
1461	D	E	P	E	E	D	D	D	E	D	E	P	E	E	D	D	D	P	E	D	P
1463	D	E	E	D	D	P	E	P	E	E	E	E	D	E	E	E	D	E	E	E	D
1465	E	E	E	E	D	E	E	P	E	D	D	E	E	D	D	P	E	E	D	D	E
1468	E	D	D	P	E	E	D	E	E	E	D	E	E	E	D	P	E	E	D	E	E
1469	D	P	E	E	D	D	P	D	D	D	P	E	E	D	D	E	E	E	E	D	E
1472	E	E	D	D	D	P	E	E	E	P	E	D	D	D	E	E	D	D	D	P	E
1474	D	E	E	D	D	P	E	E	E	P	E	E	D	P	E	E	D	P	E	E	D
1476	E	D	D	P	E	D	D	D	E	D	D	P	E	D	D	P	E	D	D	P	E
1477	E	D	D	P	E	D	D	D	E	D	D	P	E	D	D	P	E	E	D	P	E
1480	D	E	E	D	D	P	E	D	D	D	D	D	E	D	D	D	E	E	E	D	D

F1 estrous cycle data
Group IV

F1 Generation - 10 MKD																					
	5/8	5/9	5/10	5/11	5/12	5/13	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26	5/27	5/28
Animal / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1482	E	E	D	P	E	E	D	P	P	E	E	D	P	E	D	D	P	E	E	D	E
1483	D	E	E	D	D	P	E	E	D	D	P	E	E	D	P	E	E	D	E	E	D
1486	D	D	E	E	D	D	E	D	D	D	D	P	E	D	D	P	E	E	D	D	E
1488	E	D	D	D	P	E	E	E	E	E	D	D	D	E	D	D	P	E	D	D	E
1490	E	E	D	D	P	E	D	E	P	E	E	D	P	E	D	D	P	E	D	D	E
1491	D	P	E	D	D	P	E	E	D	P	E	D	D	P	E	E	D	P	E	E	D
1494	D	E	D	D	P	P	E	D	E	E	E	D	D	D	D	E	E	D	E	E	E
1496	D	P	E	D	D	P	E	D	D	P	E	D	D	P	E	E	D	P	E	E	E
1497	E	D	D	P	D	E	D	P	E	E	D	P	E	D	D	P	E	E	D	P	E
1500	D	E	E	D	D	P	E	D	D	P	E	E	D	D	P	E	E	D	E	E	E
1502	D	D	D	D	P	D	D	D	E	E	D	D	D	D	D	D	D	D	D	D	E
1505	D	D	P	E	D	D	D	E	E	D	D	E	D	D	D	E	E	D	D	E	E
1507	E	D	D	P	E	D	D	E	E	D	D	P	E	D	D	P	E	E	D	P	E
1508	E	E	D	P	E	E	D	P	E	E	D	D	E	D	D	P	E	E	D	P	E
1511	E	D	D	D	D	P	D	D	E	E	E	D	D	P	E	E	E	E	D	P	P
1513	D	P	E	D	D	P	E	D	D	P	E	D	D	P	P	D	D	P	E	D	D
1514	E	E	E	D	D	E	E	D	D	E	E	D	D	P	E	E	D	E	D	D	D
1516	E	D	D	E	E	D	D	P	E	D	D	D	E	D	D	P	E	E	D	P	E
1517	E	E	D	D	P	E	E	D	P	E	D	D	D	E	D	D	D	E	D	D	E
1519	D	D	D	E	D	D	P	E	D	D	P	E	D	D	D	P	E	E	D	D	E
1521	E	D	D	P	E	D	D	P	E	E	D	P	E	D	D	P	E	E	D	P	E
1523	E	D	D	D	E	E	D	D	E	E	D	P	E	E	D	P	E	E	D	P	E
1524	P	E	D	D	P	E	D	D	P	E	D	D	P	E	D	D	P	E	E	E	E
1527	E	E	D	D	D	E	E	D	D	P	E	E	E	D	D	P	E	E	D	P	E
1528	D	D	P	E	D	D	D	E	E	D	E	E	D	D	D	E	E	D	D	E	E
1531	D	D	P	E	E	D	D	D	E	E	D	D	D	P	E	D	D	P	E	E	D
1533	D	D	P	E	E	D	P	E	E	D	P	E	E	D	D	E	E	D	P	E	E
1534	D	E	D	D	P	E	E	D	P	E	D	D	P	E	D	D	P	E	D	D	P
1537	D	D	P	E	D	D	P	E	D	D	P	E	D	D	P	E	E	E	D	E	D
1539	E	D	D	P	D	P	D	D	P	E	E	D	D	D	E	E	D	D	D	P	E

F1 estrous cycle data
Group V

F1 Generation - 30 MKD																					
	5/8	5/9	5/10	5/11	5/12	5/13	5/14	5/15	5/16	5/17	5/18	5/19	5/20	5/21	5/22	5/23	5/24	5/25	5/26	5/27	5/28
Animal / Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1541	D	P	E	E	D	E	E	D	D	P	E	D	D	E	E	E	D	D	E	D	E
1544	E	E	D	P	E	D	D	E	E	E	D	E	E	E	D	D	E	E	D	D	E
1545	E	D	P	E	D	D	D	E	E	D	P	E	D	D	P	E	D	D	D	E	E
1546	E	D	D	E	E	D	D	E	E	D	D	E	E	D	D	D	E	E	D	P	E
1548	D	D	P	E	E	D	P	E	E	D	P	E	D	D	P	E	E	D	P	E	E
1550	D	E	E	D	P	E	E	D	P	E	E	D	E	E	D	D	P	E	D	D	E
1552	E	D	D	E	D	D	D	E	E	D	P	E	D	D	D	E	E	E	D	E	E
1555	E	D	D	P	E	D	D	P	E	D	D	E	E	D	D	D	E	E	D	P	E
1557	D	P	E	D	D	P	E	D	D	P	E	D	D	P	E	E	D	E	E	D	D
1558	E	D	D	E	E	E	E	D	P	E	E	D	P	E	D	D	D	E	D	D	E
1560	P	E	D	D	P	E	E	D	D	E	E	D	D	E	D	D	P	E	D	D	E
1564	D	D	P	E	D	D	P	E	E	D	P	E	E	D	P	E	E	D	P	E	E
1565	D	E	E	D	P	E	E	D	D	E	E	E	D	P	E	E	D	E	E	E	D
1566	E	D	D	P	E	D	D	E	E	E	D	D	D	D	D	P	E	E	D	D	E
1568	D	D	P	E	E	D	P	E	E	D	P	E	E	D	P	E	E	D	P	E	E
1571	D	D	P	E	D	D	P	E	E	D	P	E	E	D	P	E	E	D	P	E	D
1573	P	E	D	D	D	D	P	D	D	P	E	D	D	P	E	D	E	D	E	D	D
1576	D	D	D	P	E	E	D	E	E	D	D	E	E	D	D	D	P	E	E	D	E
1578	E	D	D	P	E	E	D	D	E	D	D	E	E	E	D	D	E	E	D	P	E
1579	D	P	E	D	D	P	E	D	D	E	E	D	D	P	E	E	D	E	E	D	E
1583	E	E	E	D	D	E	E	D	D	D	P	E	D	D	D	P	E	E	D	D	E
1584	P	E	E	D	D	E	D	D	P	E	E	E	D	E	E	D	E	E	D	D	E
1586	E	D	D	P	E	D	D	P	E	D	D	P	E	E	D	P	E	E	D	P	E
1587	E	D	D	P	E	E	D	D	P	E	E	D	D	P	E	E	E	D	P	E	E
1588	D	P	E	D	D	E	E	D	D	P	E	D	D	D	P	E	E	D	D	E	E
1589	E	E	D	D	D	E	E	D	E	E	E	D	D	P	E	D	D	D	D	P	D
1591	D	P	E	D	D	D	P	D	D	P	E	D	D	P	E	D	D	P	E	E	D
1593	P	E	D	D	P	E	E	D	P	E	D	D	P	E	D	D	P	E	E	D	D
1598	D	D	P	E	E	D	D	P	E	D	D	P	E	D	D	P	E	E	D	P	E
1600	E	D	D	E	E	E	D	P	E	D	D	E	E	D	D	P	E	E	D	P	E