

Study Number: R88007B
Test Type: RACB
Route: Dosing in Feed
Species/Strain: Rat/Sprague-Dawley

I04G: Mean Body Weight Gain
Test Compound: Butyl Paraben
CAS Number: 94-26-8

Date Report Requested: 03/22/2019
Time Report Requested: 15:07:20
Lab: RTI

C Number: R88007B
Study Gender: Both
PWG Approval Date See web page for date of PWG Approval

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F0 Females

Treatment Groups (ppm)

Phase	Litter ID	Days	0		5000		15000		40000	
			Wt Gain (g)	N	Wt Gain (g)	N	Wt Gain (g)	N	Wt Gain (g)	N
Gestation	A	0 - 3	17.7 ± 1.0 **	18	17.7 ± 1.1	17	17.2 ± 1.1	19	12.5 ± 0.6 **	19
		3 - 6	10.4 ± 0.3 **	18	11.1 ± 0.7	17	9.9 ± 0.6	19	7.3 ± 0.5 **	19
		6 - 9	11.4 ± 0.9	18	11.4 ± 0.6	17	9.5 ± 0.5	19	10.6 ± 0.6	19
		9 - 12	11.7 ± 1.0	18	12.0 ± 0.8	17	12.4 ± 0.7	19	10.1 ± 0.8	19
		12 - 15	16.9 ± 1.6	18	19.0 ± 1.1	17	18.0 ± 1.2	19	16.1 ± 1.0	19
		15 - 18	41.0 ± 2.2 **	18	40.4 ± 1.7	17	40.1 ± 1.4	19	32.3 ± 1.2 **	19
		18 - 21	37.9 ± 5.5 **	18	42.5 ± 2.1	17	42.0 ± 1.8	19	31.9 ± 1.4	19
		0 - 21	147.0 ± 8.7 **	18	154.2 ± 4.6	17	149.2 ± 4.5	19	120.7 ± 3.0 **	19
Lactation	A	1 - 4	3.2 ± 5.1 **	19	10.9 ± 2.9	18	8.4 ± 1.7	18	2.0 ± 1.5	19
Gestation	B	0 - 3	11.7 ± 1.0	18	13.3 ± 1.5	17	10.5 ± 2.7	20	11.8 ± 0.9	19
		3 - 6	7.0 ± 0.8	18	9.4 ± 1.6	17	9.5 ± 1.9	20	5.8 ± 0.9	19
		6 - 9	6.6 ± 1.0	18	7.3 ± 0.6	17	5.7 ± 1.5	20	8.2 ± 0.8	19
		9 - 12	11.3 ± 0.9 *	18	11.2 ± 0.8	17	13.5 ± 1.4	20	7.2 ± 0.9 *	19
		12 - 15	17.7 ± 1.2	18	19.5 ± 1.4	17	18.1 ± 0.8	20	16.8 ± 1.1	19
		15 - 18	37.8 ± 2.4 **	18	40.1 ± 2.5	17	40.7 ± 1.3	20	32.8 ± 1.0	19
		18 - 21	42.9 ± 2.2 **	18	37.8 ± 6.6	17	41.6 ± 1.9	20	34.0 ± 1.1	19
		0 - 21	135.0 ± 6.2 **	18	138.7 ± 9.3	17	139.6 ± 3.3	20	116.6 ± 3.0 *	19
Lactation	B	1 - 4	8.5 ± 2.1 **	20	10.5 ± 1.4	17	6.1 ± 1.6	20	2.4 ± 1.8 *	19
Gestation	C	0 - 3	8.4 ± 2.4 *	14	10.8 ± 1.3	12	12.4 ± 1.0	19	14.7 ± 1.6 *	15
		3 - 6	8.6 ± 1.7	14	7.7 ± 0.6	12	5.2 ± 1.0	19	7.4 ± 0.8	15
		6 - 9	5.7 ± 0.9	14	6.9 ± 0.6	12	9.0 ± 1.3	19	6.2 ± 0.7	15
		9 - 12	11.1 ± 1.4	14	11.3 ± 0.7	12	10.9 ± 0.7	19	9.6 ± 0.7	15
		12 - 15	14.7 ± 1.1	14	17.7 ± 1.3	12	15.6 ± 1.4	19	11.4 ± 1.2	15
		15 - 18	35.5 ± 2.4 *	14	40.0 ± 1.9	12	35.6 ± 2.3	19	28.4 ± 2.5	15
		18 - 21	41.4 ± 3.7 **	16	44.7 ± 2.1	12	39.5 ± 2.2	19	28.4 ± 2.7 **	16
		0 - 21	128.6 ± 5.1 *	16	139.0 ± 4.2	12	128.2 ± 6.0	19	109.0 ± 6.3 *	17

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F0 Females

Treatment Groups (ppm)

Phase	Litter ID	Days	0		5000		15000		40000	
			Wt Gain (g)	N	Wt Gain (g)	N	Wt Gain (g)	N	Wt Gain (g)	N
Lactation	C	1 - 4	14.4 ± 1.7 *	20	10.6 ± 3.2	14	14.1 ± 2.2	20	6.8 ± 3.0	16
		4 - 7	-1.5 ± 3.1	20	4.8 ± 4.9	14	-2.5 ± 3.3	20	-1.7 ± 3.1	17
		7 - 10	10.2 ± 3.0	20	10.7 ± 3.0	14	12.0 ± 3.6	20	-2.0 ± 3.3 *	17
		10 - 13	0.9 ± 1.8	20	-1.1 ± 2.6	14	-2.0 ± 2.1	19	0.6 ± 2.0	17
		13 - 16	-3.7 ± 1.4	20	-6.2 ± 2.1	14	-0.6 ± 1.3	19	-1.0 ± 1.9	17
		16 - 19	-12.2 ± 1.8 **	20	-10.6 ± 2.2	14	-4.6 ± 1.7 *	19	-1.1 ± 2.9 **	17
		19 - 21	-2.8 ± 1.8	20	-6.5 ± 2.0	14	-5.0 ± 1.7	19	1.1 ± 2.3	17
		4 - 21	-9.2 ± 2.2	20	-9.1 ± 3.8	14	-2.6 ± 2.8	19	-4.1 ± 5.0	17
		1 - 21	5.2 ± 2.6	20	1.5 ± 2.6	14	11.1 ± 3.2	19	3.7 ± 4.8	16

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F0 Females: F0 Cross Over

Phase	Litter ID	Days	Treatment Groups (ppm)			
			40000		40000 NF	
			Wt Gain (g)	N	Wt Gain (g)	N
Gestation	D	0 - 3	1.5 ± 0.7	15	15.7 ± 0.8	16
		3 - 6	6.5 ± 1.0	15	10.8 ± 0.8	16
		6 - 9	7.7 ± 0.8	15	11.1 ± 0.5	16
		9 - 12	7.8 ± 0.8	15	14.1 ± 0.8	16
		12 - 15	16.2 ± 1.6	15	15.9 ± 1.2	16
		15 - 18	32.1 ± 2.2	15	38.0 ± 2.2	16
		18 - 21	30.5 ± 2.8	15	43.1 ± 2.3	16
		0 - 21	102.3 ± 6.8	15	148.9 ± 6.5	16
Lactation	D	1 - 4	5.7 ± 2.0	15	11.9 ± 1.3	17

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F1 Females: F1c Parental Females

Phase	Litter ID	Days	Treatment Groups (ppm)							
			0		5000		15000		40000	
			Wt Gain (g)	N	Wt Gain (g)	N	Wt Gain (g)	N	Wt Gain (g)	N
Gestation	A	0 - 3	14.2 ± 1.0 **	21	16.6 ± 0.8	23	15.2 ± 1.1	29	11.1 ± 0.7	23
		3 - 6	9.4 ± 1.2	21	9.2 ± 0.5	23	9.6 ± 1.1	29	9.0 ± 0.7	23
		6 - 9	10.7 ± 0.8	21	10.0 ± 1.0	23	11.2 ± 0.8	30	11.0 ± 0.7	23
		9 - 12	13.2 ± 0.8 **	21	12.8 ± 1.0	23	13.0 ± 0.6	30	9.3 ± 0.9 **	23
		12 - 15	18.2 ± 1.6	21	19.0 ± 0.7	23	17.6 ± 1.7	30	16.5 ± 1.5	23
		15 - 18	44.3 ± 2.1 **	21	44.2 ± 2.4	23	42.0 ± 1.3	30	33.8 ± 1.5 **	23
		18 - 21	47.1 ± 2.7 **	21	50.6 ± 1.8	22	42.7 ± 4.2	30	37.8 ± 2.3	23
		0 - 21	157.1 ± 5.9 **	21	161.9 ± 4.3	22	151.3 ± 6.9	30	128.5 ± 5.2 **	23
Lactation	A	1 - 4	7.2 ± 1.5	25	7.9 ± 1.2	24	7.6 ± 2.2	30	4.2 ± 2.5	23
Gestation	B	0 - 3	11.4 ± 1.5	29	11.0 ± 0.8	24	10.8 ± 0.7	28	11.1 ± 0.6	23
		3 - 6	6.3 ± 0.7	29	6.8 ± 0.8	24	8.4 ± 0.5	28	5.9 ± 0.9	23
		6 - 9	9.4 ± 0.9	29	9.2 ± 0.5	24	7.2 ± 1.1	28	8.6 ± 0.9	23
		9 - 12	12.4 ± 1.0 *	29	12.0 ± 1.0	24	13.5 ± 1.1	28	9.8 ± 1.0	23
		12 - 15	16.4 ± 1.6	29	16.1 ± 1.0	24	17.8 ± 1.1	28	17.5 ± 0.9	23
		15 - 18	41.4 ± 3.0 *	29	40.9 ± 2.4	24	40.5 ± 2.7	28	36.1 ± 1.5	23
		18 - 21	46.3 ± 3.3 **	29	47.5 ± 2.3	24	44.2 ± 2.7	28	36.0 ± 1.6 **	23
		0 - 21	143.7 ± 8.0 **	29	143.5 ± 4.4	24	142.4 ± 6.7	28	125.0 ± 4.8 *	23
Lactation	B	1 - 4	5.6 ± 1.4 *	33	4.0 ± 1.9	28	5.2 ± 1.6	30	-0.9 ± 1.8 *	25
Gestation	C	0 - 3	10.1 ± 0.8	25	13.3 ± 1.5	28	11.7 ± 0.9	28	13.9 ± 1.0	23
		3 - 6	8.8 ± 0.9	25	7.8 ± 0.9	28	10.0 ± 1.0	28	6.6 ± 1.0	23
		6 - 9	7.5 ± 0.8	25	6.4 ± 0.8	28	6.9 ± 0.6	28	8.5 ± 0.8	23
		9 - 12	10.5 ± 1.0 *	25	13.3 ± 0.5	28	10.6 ± 0.8	28	9.1 ± 0.9	23
		12 - 15	16.2 ± 1.0	25	16.1 ± 1.6	28	15.9 ± 1.0	28	14.1 ± 1.5	23
		15 - 18	42.1 ± 2.5 **	25	36.5 ± 1.8	28	37.2 ± 2.9	28	29.5 ± 2.1 *	23
		18 - 21	43.6 ± 2.5 **	25	41.1 ± 3.3	28	38.8 ± 3.5	28	30.1 ± 2.0 *	23
		0 - 21	138.6 ± 5.8 **	25	134.4 ± 5.9	28	131.1 ± 7.5	28	111.8 ± 5.3 *	23

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F1 Females: F1c Parental Females

Phase	Litter ID	Days	Treatment Groups (ppm)							
			0		5000		15000		40000	
			Wt Gain (g)	N	Wt Gain (g)	N	Wt Gain (g)	N	Wt Gain (g)	N
Lactation	C	1 - 4	7.9 ± 1.5	27	9.9 ± 2.3	30	9.4 ± 1.0	30	4.0 ± 1.3	24
		4 - 7	2.9 ± 1.3	27	-1.4 ± 2.9	30	2.1 ± 1.5	30	-0.0 ± 1.2	24
		7 - 10	2.3 ± 1.5	27	10.1 ± 2.9	30	4.1 ± 1.7	30	2.1 ± 1.8	24
		10 - 13	0.7 ± 1.5	27	-1.0 ± 2.4	30	2.4 ± 1.9	30	-3.5 ± 3.6	24
		13 - 16	-3.7 ± 1.5	27	-1.9 ± 2.1	30	-4.0 ± 1.5	30	4.4 ± 5.4	24
		16 - 19	-8.3 ± 1.8	27	-8.2 ± 2.1	30	-1.8 ± 1.6	30	-9.9 ± 1.4	24
		19 - 21	-5.8 ± 2.2 *	27	-5.1 ± 1.7	30	-4.7 ± 1.7	30	-0.6 ± 3.2	24
		4 - 21	-11.9 ± 2.6	27	-7.5 ± 3.0	30	-1.9 ± 2.3 *	30	-7.6 ± 5.0	24
		1 - 21	-4.0 ± 2.5	27	2.4 ± 4.3	30	7.5 ± 2.4 **	30	-3.6 ± 4.8	24

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F1 Males: All F1 Males

Treatment Groups (ppm)

Phase	Litter ID	Days	0		5000		15000		40000	
			Wt Gain (g)	N	Wt Gain (g)	N	Wt Gain (g)	N	Wt Gain (g)	N
PND		21 - 28	35.5 ± 0.7 **	88	37.1 ± 1.0	74	33.5 ± 0.8	93	17.9 ± 1.2 **	32
		28 - 35	47.4 ± 0.9 **	87	46.5 ± 0.7	74	44.9 ± 0.8	93	36.1 ± 0.9 **	32
		35 - 42	45.8 ± 1.4	87	45.8 ± 1.6	74	46.3 ± 0.8	93	41.0 ± 2.0	32
		42 - 49	50.7 ± 2.0 **	87	50.6 ± 1.7	74	43.9 ± 1.6 *	93	38.8 ± 1.9 **	32
		49 - 56	46.6 ± 2.3 **	86	47.0 ± 1.3	72	46.3 ± 1.3	93	39.2 ± 1.6 *	32
		56 - 63	37.1 ± 1.7	85	36.6 ± 1.3	72	31.1 ± 0.8 **	93	34.1 ± 1.0	32
		63 - 70	27.5 ± 0.9 **	85	25.6 ± 0.6	74	20.0 ± 0.9 **	93	20.3 ± 0.6 **	32
		70 - 77	23.4 ± 1.1 **	86	22.0 ± 0.8	74	16.6 ± 1.5 **	93	15.1 ± 0.6 **	32
		77 - 84	16.6 ± 0.7	86	16.0 ± 1.6	74	17.9 ± 1.3	93	14.4 ± 0.9	32
		84 - 91	14.2 ± 0.8 **	53	16.6 ± 1.3	57	13.4 ± 0.5	54	10.5 ± 0.4 *	27
		91 - 98	12.3 ± 1.0	40	12.7 ± 0.6	40	11.5 ± 0.7	40	11.8 ± 1.5	26
		98 - 105	8.6 ± 0.6	40	7.7 ± 1.5	40	10.0 ± 0.7	39	7.3 ± 1.5	26
		105 - 112	10.2 ± 1.1	40	7.7 ± 2.5	40	11.8 ± 0.9	39	12.3 ± 1.2	26
		112 - 119	9.4 ± 0.8	39	13.8 ± 1.5 **	39	10.6 ± 0.8	39	8.7 ± 0.9	26
		119 - 126	6.7 ± 1.8	39	9.5 ± 1.0	39	9.3 ± 0.7	39	7.4 ± 0.8	26
		126 - 133	10.2 ± 0.9	40	6.8 ± 0.7 *	39	8.3 ± 0.5	39	8.2 ± 0.4	26
		133 - 140	8.0 ± 0.6	40	8.8 ± 0.9	39	7.5 ± 0.7	39	6.7 ± 0.6	26
		140 - 147	3.0 ± 0.7	40	1.3 ± 1.1	39	2.8 ± 1.1	39	2.6 ± 1.2	26
		147 - 154	5.8 ± 1.2	39	5.6 ± 2.3	38	2.6 ± 1.5	39	7.3 ± 1.5	26
		154 - 161	5.7 ± 0.7	39	6.6 ± 1.7	38	8.9 ± 1.6	39	5.7 ± 0.8	26
	161 - 168	6.6 ± 1.0	40	5.0 ± 1.7	38	5.4 ± 0.5	39	3.9 ± 0.6	26	
	168 - 175	6.8 ± 0.6	40	6.7 ± 1.0	37	6.7 ± 0.7	39	5.3 ± 0.6	26	
	175 - 182	5.7 ± 1.0	40	4.1 ± 0.7	37	4.0 ± 0.9	39	3.9 ± 1.2	26	
	182 - 189	3.7 ± 1.5	40	3.5 ± 1.2	37	3.9 ± 1.1	39	1.8 ± 0.7	26	
	189 - 196	-5.5 ± 2.6 *	39	1.5 ± 1.4 *	37	3.1 ± 1.1 **	39	2.0 ± 1.3 *	26	
	196 - 203	8.4 ± 2.0 *	39	3.4 ± 0.6 *	37	2.2 ± 0.8 **	39	3.4 ± 0.8 *	26	
	203 - 210	3.9 ± 0.9	39	3.9 ± 1.1	34	3.5 ± 0.8	39	6.6 ± 1.0	12	

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F1 Females: All F1 Females

Phase	Litter ID	Days	Treatment Groups (ppm)							
			0		5000		15000		40000	
			Wt Gain (g)	N	Wt Gain (g)	N	Wt Gain (g)	N	Wt Gain (g)	N
PND		21 - 28	30.8 ± 0.5 **	89	30.7 ± 1.0	78	27.5 ± 1.1 *	87	15.7 ± 1.3 **	26
		28 - 35	37.6 ± 0.5 **	85	38.2 ± 0.6	77	35.4 ± 0.8 *	87	28.7 ± 0.9 **	26
		35 - 42	31.9 ± 0.5	81	32.4 ± 0.7	75	30.1 ± 0.8	87	31.6 ± 0.6	26
		42 - 49	21.8 ± 1.0	81	22.3 ± 0.9	74	21.9 ± 0.7	86	25.5 ± 1.4	26
		49 - 56	25.9 ± 1.0 **	81	24.4 ± 1.3	74	18.7 ± 1.3 **	86	20.7 ± 1.8	26
		56 - 63	14.4 ± 1.1	81	16.1 ± 1.1	75	16.1 ± 1.0	87	15.2 ± 2.1	26
		63 - 70	15.0 ± 1.2	80	13.5 ± 1.3	75	12.8 ± 1.0	87	15.7 ± 1.6	26
		70 - 77	9.5 ± 1.2	80	11.2 ± 1.0	74	9.3 ± 0.7	87	9.0 ± 1.6	26
	77 - 84	8.7 ± 1.1	80	9.4 ± 1.0	74	8.6 ± 1.5	87	7.2 ± 1.4	26	

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LEGEND

Data are displayed as mean \pm SEM for the F0 animals. Data are displayed as the mean of the litter mean \pm SEM for the F1 and/or F2 animals.

SD – Study Day; GD – Gestation Day; LD – Lactation Day; PND – Postnatal Day, adults post-weaning

In multigenerational studies bodyweights reported for all animals until mating; pregnant animals only during gestation and lactation; all animals post-weaning.

In multiple breeding/littering studies Litter A is the default designation for the first litter; subsequent litters would be B, C etc.

Statistical analysis of weight data performed by Jonckheere (trend) and Williams or Dunnett (pairwise) tests.

Statistical analysis of weight data with litter-mates was performed by linear mixed models, with dam ID as random effect for both trend and pairwise analysis, and using Dunnett-Hsu adjustment for pairwise comparisons.

Statistical significance for the control group indicates a significant trend test

Statistical significance for a treatment group indicates a significant pairwise test compared to the vehicle control group

* Statistically significant at $P \leq 0.05$

** Statistically significant at $P \leq 0.01$

D Litter is crossover mating of F0 40000 ppm Females with F0 control Males and F0 naive Females with F0 40000 ppm Males (dose listed as 40000 NF are the F0 naive Females)

No analysis was performed on the D litter and F0 naive group because there were no D litter control groups.

The F1 Males: All F1 Males includes all F1 males through postnatal day 91 except at postnatal days 86-89 F1 males designated as extra were removed. It includes only the F1 Parental cohort males from postnatal day 93 through 203 with postnatal day 213 representing the F1 Parental males that had not yet been sacrificed. The F1 Non-Parental cohort males were sacrificed on postnatal days 90 through 92.

The F1 Females: All F1 Females includes all the F1 females until mating with the exception at postnatal days 86-87 the F1 females designated as extra were removed and F1 females were removed for mammary gland whole mounts on postnatal days 33-39. The F1 Non-Parental females were removed on postnatal days 90 through 92 except for the 40000 ppm group which was removed by postnatal day 26 due to toxicity.

Decrease in N for LD 1 Litter A and LD 1 Litter B for F0 Female data in the 15000 ppm group is due to one female's body weight being excluded because it was an outlier.

Decrease in N for PND 56 for the All F1 Males data in the 5000 ppm group is due to two male's body weights being excluded because they were outliers.

Decrease in N for PND 63 for the All F1 Males data in the 0 ppm group is due to one male's body weight being excluded because it was an outlier.

Decrease in N for PND 77 for the All F1 Females data in the 5000 ppm group is due to one female's body weight being excluded because it was an outlier.

Decrease in N for PND 119 for the All F1 Males data in the 0 ppm group is due to one male's body weight being excluded because it was an outlier.

NF = Naive Females

**** END OF REPORT ****