

Table 66

Two generation reproductive toxicity study of NP by oral administration in rats
 Body weight gain of F₁ dams during gestation period; Mean±S.D. (N)

Compound	Nonylphenol			
	0 ^a	2	10	50
Dose (mg/kg)				
Days of gestation				
0~7	27.3 ± 6.2 (23)	29.2 ± 6.3 (18)	25.8 ± 9.2 (19)	24.2 ± 11.1 (19)
0~14	61.3 ± 8.6 (23)	66.4 ± 9.3 (18)	60.8 ± 7.3 (19)	56.8 ± 13.0 (19)
0~20	135.3 ± 14.6 (23)	145.4 ± 16.9 (18)	135.2 ± 14.6 (19)	118.6 ± 27.9 (19)

a: vehicle control, corn oil (2 mL/kg)

Table 67

Two generation reproductive toxicity study of NP by oral administration in rats
 Body weight of F1 dams during lactation period; Mean±S.D. (N)

Compound	Nonylphenol				
	0 ^a	2	10	50	
Dose (mg/kg)					
Days of lactation					
0	338.5 ± 39.6 (23)	332.2 ± 26.3 (18)	345.7 ± 35.8 (19)	332.4 ± 35.6 (19)	
4	342.8 ± 36.2 (23)	340.9 ± 25.2 (18)	352.6 ± 25.4 (19)	335.1 ± 27.1 (19)	
7	349.2 ± 31.9 (23)	350.4 ± 21.3 (17)	359.0 ± 24.6 (19)	345.5 ± 27.7 (19)	
14	366.5 ± 29.9 (23)	371.5 ± 21.1 (17)	380.9 ± 27.6 (19)	364.9 ± 32.3 (19)	
21	351.6 ± 29.3 (23)	349.5 ± 19.0 (17)	364.1 ± 22.9 (19)	358.4 ± 31.1 (19)	

a: vehicle control, corn oil (2 mL/kg)

Table 68

Two generation reproductive toxicity study of NP by oral administration in rats
 Body weight gain of F1 dams during lactation period; Mean±S.D. (N)

Compound	Nonylphenol				
	0 ^a	2	10	50	
Days of lactation					
0~4	4.3 ± 15.3 (23)	8.7 ± 19.6 (18)	6.9 ± 15.4 (19)	2.7 ± 18.8 (19)	
0~7	10.6 ± 16.8 (23)	18.4 ± 14.9 (17)	13.2 ± 19.2 (19)	13.1 ± 17.9 (19)	
0~14	28.0 ± 20.5 (23)	39.6 ± 19.5 (17)	35.1 ± 20.8 (19)	32.5 ± 25.5 (19)	
0~20	13.0 ± 23.5 (23)	17.6 ± 18.3 (17)	18.4 ± 19.4 (19)	26.0 ± 25.7 (19)	

a: vehicle control, corn oil (2 mL/kg)

Table 69

Two generation reproductive toxicity study of NP by oral administration in rats

Food consumption of F1 dams during gestation period; Mean±S.D. (N)

Compound	Nonylphenol			
	0 ^a	2	10	50
Days of gestation				
1~2	22.5 ± 3.3 (23)	21.7 ± 2.6 (18)	22.2 ± 3.4 (19)	21.3 ± 3.5 (19)
7~8	24.3 ± 2.7 (23)	25.2 ± 2.4 (18)	23.4 ± 4.8 (19)	23.2 ± 4.5 (19)
13~14	25.1 ± 2.7 (23)	25.7 ± 2.6 (18)	26.0 ± 2.2 (19)	24.6 ± 3.1 (19)
19~20	23.5 ± 2.4 (23)	24.5 ± 3.2 (18)	25.2 ± 2.2 (19)	22.8 ± 5.5 (19)

a: vehicle control, corn oil (2 mL/kg)

Table 70

Two generation reproductive toxicity study of NP by oral administration in rats
 Food consumption of F₁ dams during lactation period; Mean±S.D. (N)

Compound	Nonylphenol			
	0 ^a	2	10	50
Days of lactation				
3~4	34.6 ± 9.6 (23)	36.7 ± 9.3 (18)	39.6 ± 5.3 (19)	35.5 ± 7.1 (19)
6~7	42.1 ± 7.5 (23)	46.6 ± 3.3 (17)	47.1 ± 6.4 (19)	43.8 ± 7.9 (19)
9~10	50.4 ± 4.8 (23)	55.0 ± 6.4 (17)	55.6 ± 6.6 (19)	53.5 ± 8.2 (19)

a: vehicle control, corn oil (2 mL/kg)

Table 71

Two generation reproductive toxicity study of NP by oral administration in rats

Organ weight of F1 dams; Mean \pm S.D. (N)

Compound	Nonylphenol							
	Dose (mg/kg)	0 ^a	2	10	50			
Terminal body weight (g)	351.6 \pm 29.3	(23)	349.5 \pm 19.0	(17)	364.1 \pm 22.9	(19)	358.4 \pm 31.1	(19)
Brain (g)	1.89 \pm 0.07	b (23)	1.88 \pm 0.09	(17)	1.91 \pm 0.07	(19)	1.91 \pm 0.10	(19)
	0.54 \pm 0.04	c	0.54 \pm 0.03		0.53 \pm 0.04		0.54 \pm 0.04	
Heart (g)	1.13 \pm 0.10	(23)	1.17 \pm 0.07	(17)	1.16 \pm 0.09	(19)	1.18 \pm 0.13	(19)
	0.32 \pm 0.02		0.34 \pm 0.02		0.32 \pm 0.03		0.33 \pm 0.03	
Lung (g)	1.10 \pm 0.12	(23)	1.08 \pm 0.08	(17)	1.11 \pm 0.08	(19)	1.11 \pm 0.09	(19)
	0.31 \pm 0.02		0.31 \pm 0.01		0.31 \pm 0.02		0.31 \pm 0.02	
Liver (g)	15.28 \pm 1.32	(23)	14.48 \pm 1.14	(17)	15.70 \pm 1.46	(19)	16.32 \pm 1.69	(19)
	4.35 \pm 0.26		4.15 \pm 0.35		4.32 \pm 0.39		4.55 \pm 0.31	
Spleen (g)	0.69 \pm 0.13	(23)	0.62 \pm 0.06	(17)	0.74 \pm 0.09	(19)	0.70 \pm 0.12	(19)
	0.20 \pm 0.03		0.18 \pm 0.02		0.20 \pm 0.02		0.20 \pm 0.03	
Kidney (g)	2.33 \pm 0.16	(23)	2.38 \pm 0.14	(17)	2.42 \pm 0.18	(19)	2.34 \pm 0.22	(19)
	0.67 \pm 0.04		0.68 \pm 0.05		0.67 \pm 0.05		0.65 \pm 0.04	

a: vehicle control, corn oil (2 mL/kg)

b: absolute weight

c: relative weight (g per 100g body weight)

Table 71 (continued)

Two generation reproductive toxicity study of NP by oral administration in rats
Organ weight of F1 dams; Mean \pm S.D. (N)

Compound	Dose (mg/kg)	Nonylphenol				
		0 ^a	2	10	50	
Terminal body weight	(g)	351.6 \pm 29.3 (23)	349.5 \pm 19.0 (17)	364.1 \pm 22.9 (19)	358.4 \pm 31.1 (19)	
Adrenal glands	(mg)	74.2 \pm 8.8 (23) 21.2 \pm 2.9	73.8 \pm 11.8 (17) 21.2 \pm 3.8	74.0 \pm 11.2 (19) 20.3 \pm 2.7	76.0 \pm 8.8 (19) 21.3 \pm 2.7	
Thymus	(mg)	187.9 \pm 66.1 (23) 53.1 \pm 17.1	193.4 \pm 54.7 (17) 55.6 \pm 16.4	179.3 \pm 53.2 (19) 49.4 \pm 14.7	176.3 \pm 53.1 (19) 49.3 \pm 14.5	
Ovary	(mg)	108.7 \pm 34.4 (23) 30.9 \pm 9.9	98.7 \pm 12.4 (17) 28.4 \pm 4.1	101.3 \pm 13.4 (19) 27.9 \pm 3.7	85.1 \pm 12.3 ** (19) 23.7 \pm 2.7 **	
Uterus	(g)	0.40 \pm 0.09 (23) 0.12 \pm 0.03	0.43 \pm 0.12 (17) 0.13 \pm 0.03	0.40 \pm 0.06 (19) 0.11 \pm 0.02	0.39 \pm 0.10 (19) 0.11 \pm 0.03	
Thyroid glands	(mg)	16.5 \pm 3.5 (23) 4.7 \pm 0.9	15.9 \pm 2.2 (17) 4.5 \pm 0.7	16.4 \pm 3.0 (19) 4.5 \pm 0.7	18.2 \pm 3.1 (19) 5.1 \pm 0.9	
Pituitary gland	(mg)	14.5 \pm 3.5 (23) 4.1 \pm 0.9	12.7 \pm 2.1 (17) 3.6 \pm 0.5	14.1 \pm 3.0 (19) 3.9 \pm 0.7	14.4 \pm 2.2 (19) 4.0 \pm 0.6	

a: vehicle control, corn oil (2 mL/kg)

b: absolute weight

c: relative weight (g or mg per 100g body weight)

**: significant difference from control, p<0.01

Table 72

Two generation reproductive toxicity study of NP by oral administration in rats

Serum concentrations of prolactin (PRL), luteinizing hormone (LH), follicle-stimulating hormone (FSH), thyroid stimulating hormone (TSH), triiodothyronine (T₃), thyroxine (T₄), estradiol in F₁ females; Mean±S.D. (N)

Compound	Dose (mg/kg)	Nonylphenol				
		0 ^a	2	10	50	
PRL	(ng/mL)	264.4 ± 284.9 (23)	85.8 ± 83.0 (16)	248.2 ± 368.9 (19)	203.6 ± 209.8 (19)	(19)
LH	(ng/mL)	13.4 ± 2.1 (23)	12.7 ± 2.0 (17)	13.8 ± 1.5 (19)	12.8 ± 2.1 (19)	(19)
FSH	(ng/mL)	238.8 ± 47.2 (23)	286.5 ± 59.3 * (17)	269.1 ± 47.3 (19)	244.6 ± 70.3 (19)	(19)
TSH	(ng/mL)	16.1 ± 3.8 (23)	20.1 ± 2.8 ** (17)	17.3 ± 2.5 (19)	18.1 ± 3.4 (19)	(19)
T ₃	(ng/mL)	0.9 ± 0.2 (22)	0.7 ± 0.2 * (12)	0.8 ± 0.1 (17)	0.7 ± 0.2 ** (16)	(16)
T ₄	(ng/mL)	51.8 ± 11.3 (23)	54.1 ± 13.1 (17)	47.6 ± 6.1 (19)	48.4 ± 11.0 (19)	(19)
Estradiol	(pg/mL)	13.4 ± 7.4 (14)	11.2 ± 7.4 (6)	18.9 ± 4.9 (3)	10.3 ± 7.7 (13)	(13)

a : vehicle control, corn oil (2 mL/kg)

* : significant difference from control, p<0.05

** : significant difference from control, p<0.01

Table 73

Two generation reproductive toxicity study of NP by oral administration in rats
 Macroscopic findings in F1 females

Group Grade	0 mg/kg		2 mg/kg		10 mg/kg		50 mg/kg	
	-	+	-	+	-	+	-	+
(Liver)	[30]	0	[21]	1	[25]	0	[23]	0
Pale (Stomach)	[30]	0	[21]	1	[25]	0	[23]	0
Nodule, mucosa, glandular stomach	30	0	21	0	23	0	21	1
(Adrenal gland)	[30]	0	[21]	1	[25]	0	[23]	0
Enlargement (Spleen)	[30]	0	[21]	1	[25]	0	[23]	0
Dark (Thymus)	[30]	0	[21]	1	[25]	0	[23]	0
Small	30	0	20	1	23	0	22	0

-, Negative; +, Positive

[], Number of animals examined

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Two generation reproductive toxicity study of NP by oral administration in rats

Summary of histopathological findings in F1 female

Group Grade	0 mg/kg			2 mg/kg			10 mg/kg			50 mg/kg		
	-	+/-	+	-	+/-	+	-	+/-	+	-	+/-	+
(Ovary)	[8]			[9]			[9]			[9]		
No remarkable change (Uterus)	[8]			[9]			[9]			[9]		
No remarkable change (Vagina)	[8]	3	5	[9]	5	1	[9]	6	1	[9]	3	1
Mucification, epithelium		1	1		2	1		1	1		0	4
Cornification, epithelium		0	2		4	4		2	3		0	5
(Liver)	[8]			[9]			[9]			[9]		
Hypertrophy, hepatocyte, centrilobular		8	0		9	0		9	0		0	7
Sponiosis		8	0		9	0		8	1		0	1
Necrosis, focal		7	0		8	1		7	0		2	0
(Spleen)	[8]			[0]			[0]			[9]		
Hematopoiesis, extramedullary		0	3		8	5		0	3		6	0
Deposit, pigment, brown		0	1		8	7		0	1		8	0
(Thymus)	[8]			[0]			[0]			[9]		
Atrophy		7	1		1	0		9	0		0	0
(Kidney)	[8]			[0]			[0]			[9]		
Basophilic tubule, cortex		6	2		2	0		8	1		0	1
Cyst,												
cortico-medullary junction		8	0		0	0		8	0		1	0
Cellular infiltration,												
lymphocyte, interstitium		7	1		1	0		8	1		0	0
Hyperplasia, transitional epithelium, focal, with mineralization,												
renal pelvis		7	1		1	0		9	0		0	0
Mineralization, papilla		8	0		0	0		9	0		0	0
(Mammary gland)	[8]			[0]			[0]			[9]		
No remarkable change (Thyroid gland)	[8]			[0]			[0]			[9]		
No remarkable change (Parathyroid gland)	[7]			[0]			[0]			[8]		
No remarkable change (Pituitary gland)	[8]			[0]			[0]			[9]		
No remarkable change (Adrenal gland)	[8]			[0]			[0]			[9]		
Necrosis, focal, fascicular zone, with hemorrhage		7	0		1	0		9	0		0	0

-, Negative; +/-, Very slight; +, Slight; ++, Moderate; +++, Severe; Pos., Total of positive grade

[], Number of animals examined

Table 75

Two generation reproductive toxicity study of NP by oral administration in rats
Development of F2 offspring up to weaning; Mean±S.D. (N)

Compound	Nonylphenol				
	Dose (mg/kg)				
	0 ^a				
	2	10	50		
Gestation period; days	22.0 ± 0.4 (23)	22.1 ± 0.3 (18)	22.0 ± 0.5 (19)	21.9 ± 0.2 (19)	
Implantations	14.9 ± 2.6 (23)	15.2 ± 1.6 (18)	14.6 ± 1.5 (19)	12.5 ± 3.3 * (19)	
Delivery index; dams A)	100	100	100	100	
Day 0					
Fetuses delivered	13.5 ± 2.3 (23)	14.3 ± 2.2 (18)	13.3 ± 1.8 (19)	11.5 ± 3.0 * (19)	
Delivery index; fetuses B)	91.5 ± 10.8 (23)	94.3 ± 9.3 (18)	91.1 ± 8.4 (19)	92.6 ± 7.4 (19)	
Live newborns	13.2 ± 2.2 (23)	14.2 ± 2.3 (18)	13.2 ± 1.6 (19)	11.3 ± 2.9 * (19)	
Birth index C)	89.7 ± 11.3 (23)	93.2 ± 10.4 (18)	90.4 ± 7.8 (19)	91.0 ± 6.9 (19)	
Viability index D)	97.9 ± 4.3 (23)	98.8 ± 3.8 (18)	99.3 ± 2.0 (19)	98.3 ± 3.3 (19)	
Day 4					
Live offspring	12.9 ± 2.4 (23)	13.8 ± 2.0 (18)	12.7 ± 1.7 (19)	11.3 ± 2.9 * (19)	
Viability index E)	97.6 ± 7.2 (23)	98.0 ± 4.9 (18)	96.5 ± 9.7 (19)	99.6 ± 1.8 (19)	
Offspring after culling	8.0 ± 0.2 (23)	8.0 ± 0.0 (18)	8.0 ± 0.0 (19)	7.6 ± 1.0 (19)	
Males	4.0 ± 0.6 (23)	3.9 ± 1.0 (18)	4.1 ± 0.5 (19)	3.9 ± 0.7 (19)	
Females	4.0 ± 0.7 (23)	4.1 ± 1.0 (18)	3.9 ± 0.5 (19)	3.7 ± 0.7 (19)	
Day 21					
Live offspring	7.8 ± 0.7 (23)	7.6 ± 1.9 (18)	7.9 ± 0.3 (19)	7.6 ± 1.0 (19)	
Males	4.0 ± 0.6 (23)	3.7 ± 1.0 (18)	4.0 ± 0.5 (19)	3.9 ± 0.7 (19)	
Females	3.9 ± 0.8 (23)	3.8 ± 1.0 (18)	3.9 ± 0.5 (19)	3.7 ± 0.7 (19)	
Weaning index F)	98.4 ± 7.8 (23)	94.4 ± 23.6 (18)	98.7 ± 3.9 (19)	100.0 ± 0.0 (19)	

A): Delivery index; dams = (no. of dams having live newborns / no. of pregnant females) x 100

B): Delivery index; fetuses = (no. of fetuses delivered / no. of implantations) x 100

C): Birth index = (no. of live newborns / no. of implantations) x 100

D): Viability index; Day 0 = (no. of live newborns / no. of offspring delivered) x 100

E): Viability index; Day 4 = (no. of live offspring on day 4 / no. of live offspring on day 0) x 100

F): Weaning index = (no. of live offspring at weaning / no. of live offspring on day 4) x 100

a : vehicle control, corn oil (2 mL/kg)

* : significant difference from control, p<0.05

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Two generation reproductive toxicity study of NP by oral administration in rats

Body weight of F2 offspring up to weaning; Mean±S.D. (N)

Compound	Nonylphenol				
	0 ^a	2	10	50	
Day 0					
Male	6.6 ± 0.5 (23)	6.5 ± 0.4 (18)	6.7 ± 0.4 (19)	6.8 ± 0.5 (19)	
Female	6.3 ± 0.4 (23)	6.1 ± 0.4 (18)	6.3 ± 0.4 (19)	6.4 ± 0.4 (19)	
Day 4 (After culling)					
Male	10.2 ± 1.6 (23)	10.0 ± 1.2 (18)	10.5 ± 1.0 (19)	10.7 ± 1.5 (19)	
Female	9.7 ± 1.5 (23)	9.5 ± 1.2 (18)	9.9 ± 1.0 (19)	10.4 ± 1.5 (19)	
Day 7					
Male	17.1 ± 2.7 (23)	17.0 ± 1.0 (17)	17.2 ± 1.6 (19)	16.9 ± 1.8 (19)	
Female	16.3 ± 3.4 (23)	16.2 ± 1.1 (17)	16.4 ± 1.4 (19)	16.5 ± 1.9 (19)	
Day 14					
Male	34.4 ± 3.4 (23)	35.2 ± 1.8 (17)	35.9 ± 3.1 (19)	34.0 ± 3.9 (19)	
Female	33.1 ± 3.4 (23)	34.0 ± 1.9 (17)	34.2 ± 3.0 (19)	33.3 ± 3.6 (19)	
Day 21					
Male	56.1 ± 5.8 (23)	58.2 ± 3.5 (17)	58.6 ± 5.5 (19)	55.7 ± 6.7 (19)	
Female	53.6 ± 5.6 (23)	54.9 ± 6.1 (17)	55.1 ± 5.1 (19)	53.5 ± 5.8 (19)	

a: vehicle control, corn oil (2 mL/kg)

Table 77

Two generation reproductive toxicity study of NP by oral administration in rats

Morphological observations of F2 live pups at birth

Compound	Nonylphenol			
Dose (mg/kg)	0 ^a	2	10	50
Number of live pups examined	304	255	251	215
<u>External abnormalities</u>	0	0	0	0
Number of pups	0	0	0	0

a: vehicle control, corn oil (2 mL/kg)

b: animal no., FB02014FB001

Table 78

Two generation reproductive toxicity study of NP by oral administration in rats

Morphological observations of F₂ dead pups during lactation period

Compound	Nonylphenol			
Dose (mg/kg)	^a 0	2	10	50
Number of dead pups ^b	17	17	14	5
Number of dead pups collected	10	10	3	5
Number of dead pups observed	7	1	6	11
<u>External abnormalities</u>				
Number of pups	0	1	0	0
<u>Types and number</u>				
Emaciation	0	1	0	1
<u>Visceral abnormalities</u>				
Number of pups	0	0	0	0

a: vehicle control, corn oil (2 mL/kg)

b: including missing pup

Table 79

Two generation reproductive toxicity study of NP by oral administration in rats
 Morphological observations of F2 pups culled on postnatal day 4

Compound	Nonylphenol		
Dose (mg/kg)	0 ^a	2	10
Number of pups examined	114	105	89
<u>External abnormalities</u>			
Number of pups	0	0	0
<u>Visceral abnormalities</u>			
Number of pups	0	0	0

a: vehicle control, corn oil (2 mL/kg)

b: animal no., FE03013FE001

Table 80

Two generation reproductive toxicity study of NP by oral administration in rats
Morphological observations of F₂ weanlings on postnatal day 21

Compound	Nonylphenol		
Dose (mg/kg)	0 ^a	2	10
Number of weanlings examined	180	136	150
<u>External abnormalities</u>			
Number of weanlings	0	0	0
<u>Visceral abnormalities</u>			
Number of weanlings	3	1	1
<u>Types and number</u>			
Dilatation of the renal pelvis	2	1	0
Small testis	1	0	1

a: vehicle control, corn oil (2 mL/kg)

Table 81

Two generation reproductive toxicity study of NP by oral administration in rats

Organ weight of F1 males; Mean \pm S.D. (N)

Compound	Nonylphenol				
	0 ^a	2	10	50	
Dose (mg/kg)					
Terminal body weight (g)	599.5 \pm 71.3 (30)	630.0 \pm 50.8 (21)	604.8 \pm 64.9 (25)	596.4 \pm 56.1 (23)	
Brain (g)	2.05 \pm 0.09 b (29) 0.34 \pm 0.03 c (29)	2.03 \pm 0.09 (21) 0.32 \pm 0.03 (21)	2.06 \pm 0.08 (25) 0.35 \pm 0.04 (25)	2.08 \pm 0.11 (23) 0.35 \pm 0.03 (23)	
Heart (g)	1.57 \pm 0.14 (30) 0.26 \pm 0.02 (30)	1.66 \pm 0.16 (21) 0.26 \pm 0.02 (21)	1.52 \pm 0.16 (25) 0.25 \pm 0.02 (25)	1.59 \pm 0.17 (23) 0.27 \pm 0.02 (23)	
Lung (g)	1.42 \pm 0.15 (30) 0.24 \pm 0.02 (30)	1.39 \pm 0.11 (21) 0.22 \pm 0.02 (21)	1.45 \pm 0.22 (25) 0.24 \pm 0.03 (25)	1.40 \pm 0.08 (23) 0.24 \pm 0.02 (23)	
Liver (g)	21.04 \pm 3.16 (30) 3.50 \pm 0.23 (30)	21.59 \pm 2.10 (21) 3.31 \pm 0.57 (21)	21.82 \pm 3.25 (25) 3.60 \pm 0.33 (25)	22.26 \pm 2.81 (23) 3.73 \pm 0.27 * (23)	
Spleen (g)	0.92 \pm 0.16 (30) 0.15 \pm 0.02 (30)	0.92 \pm 0.10 (21) 0.15 \pm 0.02 (21)	0.91 \pm 0.10 (25) 0.15 \pm 0.01 (25)	0.93 \pm 0.18 (23) 0.16 \pm 0.03 (23)	
Kidneys (g)	3.41 \pm 0.43 (30) 0.57 \pm 0.07 (30)	3.55 \pm 0.34 (21) 0.56 \pm 0.03 (21)	3.52 \pm 0.41 (25) 0.59 \pm 0.07 (25)	3.71 \pm 0.35 (23) 0.62 \pm 0.04 ** (23)	
Adrenal glands (mg)	56.0 \pm 9.3 (30) 9.4 \pm 1.6 (30)	60.1 \pm 10.2 (21) 9.6 \pm 1.9 (21)	57.2 \pm 12.1 (25) 9.4 \pm 1.5 (25)	53.6 \pm 9.9 (23) 9.0 \pm 1.5 (23)	
Thymus (mg)	303.7 \pm 62.8 (30) 50.9 \pm 10.1 (30)	273.1 \pm 58.5 (21) 43.2 \pm 8.5 * (21)	307.3 \pm 81.6 (25) 50.6 \pm 10.7 (25)	267.7 \pm 70.1 (23) 45.1 \pm 12.3 (23)	

a: vehicle control, corn oil (2 mL/kg)

b: absolute weight

c: relative weight (g or mg per 100g body weight)

*: significantly difference from control, p<0.05

**: significantly difference from control, p<0.01

Table 81 (continued)

Two generation reproductive toxicity study of NP by oral administration in rats

Organ weight of F1 males; Mean \pm S.D. (N)

Compound	Nonylphenol				
	0 ^a	2	10	50	
Terminal body weight (g)	599.5 \pm 71.3 (30)	630.0 \pm 50.8 (21)	604.8 \pm 64.9 (25)	596.4 \pm 56.1 (23)	
Testes (g)	3.61 \pm 0.25 b (30) 0.61 \pm 0.07 c (30)	3.52 \pm 0.36 (21) 0.56 \pm 0.06 (21)	3.47 \pm 0.31 (25) 0.58 \pm 0.08 (25)	3.45 \pm 0.28 (23) 0.58 \pm 0.08 (23)	
Epididymides (g)	1.32 \pm 0.10 (30) 0.22 \pm 0.02 (30)	1.40 \pm 0.14 (21) 0.22 \pm 0.02 (21)	1.30 \pm 0.11 (25) 0.22 \pm 0.03 (25)	1.27 \pm 0.10 (23) 0.21 \pm 0.02 (23)	
Ventral prostate (g)	0.70 \pm 0.14 (30) 0.12 \pm 0.02 (30)	0.65 \pm 0.16 (21) 0.10 \pm 0.03 (21)	0.69 \pm 0.33 (25) 0.12 \pm 0.06 (25)	0.64 \pm 0.15 (23) 0.11 \pm 0.02 (23)	
Seminal vesicle (g)	1.80 \pm 0.25 (30) 0.30 \pm 0.05 (30)	1.88 \pm 0.24 (21) 0.30 \pm 0.05 (21)	1.87 \pm 0.28 (25) 0.31 \pm 0.06 (25)	1.80 \pm 0.34 (23) 0.30 \pm 0.05 (23)	
Prostate and seminal vesicle (mg)	2.99 \pm 0.38 (30) 0.50 \pm 0.07 (30)	3.03 \pm 0.38 (21) 0.48 \pm 0.08 (21)	3.08 \pm 0.50 (25) 0.52 \pm 0.11 (25)	2.90 \pm 0.43 (23) 0.49 \pm 0.07 (23)	
Thyroid glands (mg)	20.1 \pm 4.6 (30) 3.4 \pm 0.9 (30)	22.7 \pm 4.5 (21) 3.6 \pm 0.8 (21)	21.3 \pm 4.8 (25) 3.5 \pm 0.8 (25)	21.6 \pm 4.9 (23) 3.6 \pm 0.7 (23)	
Pituitary gland (mg)	12.3 \pm 2.1 (30) 2.0 \pm 0.3 (30)	12.2 \pm 2.2 (21) 2.0 \pm 0.4 (21)	12.4 \pm 1.6 (25) 2.0 \pm 0.3 (25)	13.5 \pm 1.8 (23) 2.3 \pm 0.3 (23)	

a: vehicle control, corn oil (2 mL/kg)

b: absolute weight

c: relative weight (g or mg per 100g body weight)

Table 82

Two generation reproductive toxicity study of NP by oral administration in rats
Epididymal sperm findings in F1 males

Compound	Nonylphenol			
	0 ^a	2	10	50
Dose (mg/kg)				
Number of F1 males examined	30	21	25	23
% of motile (Mean ± S.D.)	95.5 ± 3.4	96.7 ± 3.9	94.6 ± 6.0	94.8 ± 4.2
% of progressive (Mean ± S.D.)	82.5 ± 6.6	84.2 ± 9.5	81.6 ± 8.1	81.0 ± 6.1
Sperm counts (Mean±S.D.)				
Caudal epididymis weight	0.3033 ± 0.0337 (30)	0.3157 ± 0.027 (20)	0.3086 ± 0.033 (25)	0.2971 ± 0.029 (23)
No. of sperm per caudal epididymis (x10 ⁶)	535.0 ± 155.2 (30)	580.2 ± 169.1 (20)	586.3 ± 169.3 (25)	664.7 ± 175.4 (23)
No. of sperm per caudal epididymis weight (x10 ⁶ /g)	1767.2 ± 436.5 (30)	1847.7 ± 558.7 (20)	1918.5 ± 536.5 (25)	2242.3 ± 582.3** (23)

a : vehicle control, corn oil (2 mL/kg)

** : significant difference from control, p<0.01

Table 83

Two generation reproductive toxicity study of NP by oral administration in rats

Serum concentrations of testosterone, luteinizing hormone (LH), follicle-stimulating hormone (FSH), thyroid stimulating hormone (TSH), triiodothyronine (T₃), thyroxine (T₄) in F₁ males; Mean±S.D. (N)

Compound	Nonylphenol				
	0 ^a	2	10	50	
Testosterone (ng/mL)	7.6 ± 4.9 (30)	9.7 ± 6.4 (21)	8.1 ± 6.6 (25)	7.0 ± 5.2 (23)	
LH (ng/mL)	12.2 ± 2.1 (30)	13.3 ± 2.0 (21)	11.5 ± 1.6 (25)	11.9 ± 1.4 (23)	
FSH (ng/mL)	301.7 ± 68.5 (30)	243.5 ± 50.9 * (21)	306.1 ± 77.3 (25)	291.1 ± 80.6 (23)	
TSH (ng/mL)	12.6 ± 2.2 (30)	14.1 ± 2.5 (21)	14.1 ± 2.8 (25)	13.5 ± 2.2 (23)	
T ₃ (ng/mL)	0.8 ± 0.1 (30)	0.6 ± 0.1 ** (20)	0.8 ± 0.1 (25)	0.7 ± 0.1 ** (23)	
T ₄ (ng/mL)	76.1 ± 10.1 (30)	75.3 ± 8.4 (21)	73.6 ± 8.9 (25)	76.4 ± 10.6 (23)	

a : vehicle control, corn oil (2 mL/kg)

* : significant difference from control, p<0.05

** : significant difference from control, p<0.01