Supplementary Table 1. The Number of each breed and sex in Japan and the United States.

a. Japan

Breed	Male (intact)	Male (castrated)	Female (intact)	Female (spayed)	Total	Cumulative %
Poodle (Toy)	68 (2)	127 (9)	52 (3)	113 (8)	360	12.91
Dachshund (Miniature)	78 (11)	80 (10)	49 (8)	85 (13)	292	23.38
Shiba Inu	56 (16)	41 (15)	34 (6)	96 (26)	227	31.52
Chihuahua	30 (15)	63 (40)	34 (25)	50 (30)	177	37.86
Labrador Retriever	12 (12)	27 (27)	15 (14)	28 (25)	82	40.80
Miniature Schnauzer	15 (10)	29 (20)	17 (13)	19 (17)	80	43.67
Border Collie	19 (18)	23 (19)	13 (13)	24 (24)	79	46.50
Papillon	12 (4)	22 (20)	10 (3)	33 (9)	77	49.26
Pembroke Welsh Corgi	17 (10)	20 (14)	11 (7)	27 (17)	75	51.95
French Bulldog	18 (4)	20 (5)	7 (2)	25 (7)	70	54.46
Jack Russell Terrier	15 (11)	25 (18)	6 (6)	23 (23)	69	56.94
Pomeranian	4 (3)	30 (22)	11 (11)	14 (14)	59	59.05
Shetland Sheepdog	12 (12)	13 (13)	16 (11)	16 (14)	57	61.10
Yorkshire Terrier	14 (10)	18 (13)	10 (10)	13 (13)	55	63.07
Golden Retriever	13 (5)	18 (17)	6 (6)	16 (16)	53	64.97
Pug	13 (13)	9 (9)	6 (6)	18 (16)	46	66.62
Cavalier King Charles Spaniel	6 (6)	12 (12)	4 (2)	23 (16)	45	68.23
Beagle	7 (7)	14 (14)	6 (5)	16 (16)	43	69.77
Shih Tzu	7 (7)	12 (12)	7 (6)	14 (13)	40	71.21
Italian Greyhound	8 (1)	16 (8)	3 (2)	11 (7)	38	72.57
Maltese	7 (4)	16 (10)	7 (7)	7 (7)	37	73.90
Boston Terrier	8 (8)	8 (8)	2 (2)	14 (14)	32	75.04
Miniature Pinscher	8 (7)	9 (6)	4 (3)	10 (10)	31	76.16
Bernese Mountain Dog	8 (7)	2 (1)	4 (4)	4 (4)	18	76.80
Flat-Coated Retriever	2 (2)	2 (2)	3 (1)	9 (3)	16	77.38
Cocker Spaniel (American)	4 (2)	6 (5)	1 (1)	4 (4)	15	77.91
Poodle (Miniature)	2 (2)	4 (4)	3 (2)	5 (4)	14	78.42
German Shepherd	4 (4)	1 (1)	4 (3)	3 (2)	12	78.85
Cocker Spaniel (English)	2 (2)	3 (3)	2 (2)	4 (3)	11	79.24
West Highland White Terrier	2 (1)	4 (4)	2 (2)	3 (3)	11	79.63
Bichon Frise	1 (1)	4 (4)	1 (1)	5 (4)	11	80.03
Pekingese	2 (1)	4 (3)	3 (3)	1 (1)	10	80.39
Kai	4	2	1	3	10	80.75
Japanese Spitz	2	1	2	5	10	81.10
Poodle (Standard)	1 (1)	3 (3)	3 (2)	2 (2)	9	81.43
Doberman Pinscher	2	3 (3)	0	3 (3)	8	81.71
Whippet	2 (2)	2 (1)	0	3 (3)	7	81.96
Australian Shepherd	2 (1)	2 (2)	0	3 (3)	7	82.22
Siberian Husky	5 (1)	1	1 (1)	0	7	82.47
Dalmatian	1 (1)	2 (2)	1 (1)	3 (2)	7	82.72
Akita	3 (2)	2	1 (1)	1 (1)	7	82.97
Pointer	1 (1)	3 (1)	1 (1)	1 (1)	6	83.18
Miniature Bull Terrier	1	2	0	3	6	83.40
English Setter	1 (1)	3	0	1 (1)	5	83.58
Cardigan Welsh Corgi	0	1	2	2	5	83.76
Basenji	2 (2)	0	0	3 (2)	5	83.94
Belgian Groenendal	1	3 (1)	0	1 (1)	5	84.12
Boxer	1 (1)	1 (1)	0	3 (2)	5	84.30
English Springer Spaniel	1 (1)	1 (1)	0	2 (2)	4	84.44
Cairn Terrier	1 (1)	1 (1)	1 (1)	1 (1)	4	84.58
Kooikwehondje	1	3	0	0	4	84.73
Samoyed	0	1 (1)	1	2 (1)	4	84.87
Norfolk Terrier	0	1	0	3	4	85.01
Border Terrier	1	2 (1)	0	1 (1)	4	85.16
White Swiss Shepherd Dog	3	0	1	0	4	85.30
Fox Terrier (Wire/Wire-haired)	1 (1)	0	0	3 (1)	4	85.44
Kishu Inu	0	2	2	0	4	85.59
Hokkaido Inu	1	1	0	2	4	85.73
Airedale Terrier	1 (1)	1	0	1 (1)	3	85.84
Old English Sheepdog	2	1	0	0	3	85.94
Manchester Terrier (toy)	1 (1)	0	1 (1)	1	3	86.05
Brussels Griffon	2 (1)	0	0	1 (1)	3	86.16
Bulldog	1	1 (1)	0	1 (1)	3	86.27
Belgian Tervuren	0	1 (1)	1 (1)	1	3	86.38
Borzoi	1 (1)	0	1	1 (1)	3	86.48
Bolognese	0	1	1	1	3	86.59
Collie (Rough)	0	0	2	1	3	86.70
Leonberger	1	0	0	2	3	86.81
Japanese Chin	0	3	0	0	3	86.91
Irish Setter	0	0	1	1	2	86.98
Australian Kelpie	0	1 (1)	0	1 (1)	2	87.06
Great Dane	0	1 (1)	0	1 (1)	2	87.13
Great Pyrenees	0	0	0	2	2	87.20
Scottish Terrier	0	0	1	1	2	87.27
Tibetan Spaniel	2	0	0	0	2	87.34
Norwich Terrier	0	2	0	0	2	87.41
Brittany	0	1 (1)	0	1 (1)	2	87.49
Lakeland Terrier	1 (1)	0	1 (1)	0	2	87.56
Weimaraner	1	1	0	0	2	87.63
Iceland Sheepdog	0	1	0	0	1	87.67
Afghan Hound	0	0	1	0	1	87.70
American Terrier	0	1	0	0	1	87.74
Saluki	0	1	0	0	1	87.77
German Shorthaired Pointer	0	0	1	0	1	87.81
Schipperke	0	0	0	1	1	87.85
Spanish Water Dog	0	1	0	0	1	87.88
Collie (Smooth)	0	0	1	0	1	87.92
Dachshund	0	1	0	0	1	87.95
Tibetan Mastiff	1	0	0	0	1	87.99
Chinese Crested	1	0	0	0	1	88.02
Dogo Argentino	0	0	1	0	1	88.06
New Zealand Heading Dog	0	0	0	1	1	88.10
Basset Hound	0	0	0	1	1	88.13
Havanese	0	0	1	0	1	88.17
Vizsla	0	1	0	0	1	88.20
Bearded Collie	0	0	0	1	1	88.24
Poodlepointer	0	1	0	0	1	88.28
Bouvier des Flandres	0	0	0	1	1	88.31
Fox Terrier	0	0	0	1	1	88.35
Toy Fox Terrier	0	1	0	0	1	88.38
Petit Basset Griffon Vendeen	0	0	0	1	1	88.42
Petit Brabancon	0	0	1	0	1	88.45
Bull Terrier	1	0	0	0	1	88.49
Plott Hound	1	0	0	0	1	88.53
Belgian Griffon	0	1	0	0	1	88.56
White Shepherd Dog	0	0	0	1	1	88.60
Maremma Sheepdog	0	0	0	1	1	88.63
Lhasa Apso	0	0	1	0	1	88.67
Labradoodle	0	1	0	0	1	88.71
Rottweiler	0	1	0	0	1	88.74
Shikoku Inu	1	0	0	0	1	88.78
Kawakami Inu	0	0	1	0	1	88.81
Japanese Terrier	0	0	1	0	1	88.85
Mixed Breed/Unknown	46	92	45	128	311	100.00
Total	**576 (239)**	**842 (378)**	**433 (200)**	**938 (417)**	**2789**	

b. The United States

Breed	Male (intact)	Male (castrated)	Female (intact)	Female (spayed)	Total	Cumulative %
Labrador Retriever	52 (5)	267 (34)	40 (5)	259 (34)	618	5.95
German Shepherd	69	149 (5)	65	181 (5)	464	10.41
Golden Retriever	42 (5)	132 (17)	39 (8)	120 (14)	333	13.62
Border Collie	34 (6)	105 (31)	31 (8)	99 (29)	269	16.21
Rottweiler	51	85	50	79	265	18.76
Australian Shepherd	27 (1)	109 (2)	26 (1)	96 (2)	258	21.24
Doberman Pinscher	49 (1)	57 (2)	38 (1)	69 (2)	213	23.29
Soft Coated Wheaten Terrier	28	63	30	67	188	25.10
American Pit Bull Terrier	11	87	10	73	181	26.85
Poodle (Standard)	21 (1)	70 (3)	15 (1)	57 (3)	163	28.41
Australian Cattle Dog	13	69	10	69	161	29.96
Collie	35	38	30	32	135	31.26
Mastiff (English)	32	52	24	26	134	32.55
Boxer	11 0	53 (2)	12 (1)	55 (1)	131	33.81
Bernese Mountain Dog	17 (7)	49 (1)	25 (2)	34 (6)	125	35.02
Cocker Spaniel (American)	11 (3)	58 (2)	13 (1)	43 (4)	125	36.22
Jack Russell Terrier	16 (6)	58 (23)	11 (5)	35 (24)	120	37.38
Chihuahua	5 (5)	50 (50)	11 (11)	45 (44)	111	38.44
Akita	27 (1)	34 (1)	15 (1)	31 (1)	107	39.47
Great Dane	9	40 (1)	12	40 (1)	101	40.45
Beagle	6 (4)	45 (17)	6 (5)	41 (16)	98	41.39
Siberian Husky	15 (1)	37	12	28 (1)	92	42.28
Shetland Sheepdog	7 (4)	44 (21)	9 (5)	31 (20)	91	43.15
Havanese	11	35	21	20	87	43.99
Portuguese Water Dog	13	23	24	26	86	44.82
Rhodesian Ridgeback	24	22	22	15	83	45.62
Bichon Frise	3	35 (5)	2	42 (5)	82	46.40
Shiba Inu	12 (7)	38 (25)	10 (10)	22 (22)	82	47.19
Dachshund	7	40	9	19	75	47.92
English Springer Spaniel	13 (1)	29 (1)	10 (1)	22 (1)	74	48.63
Pomeranian	16 (8)	28 (17)	8 (8)	19 (17)	71	49.31
Airedale Terrier	10 (1)	22	8	29 (1)	69	49.98
Belgian Malinois	15	17	14	23	69	50.64
Greyhound	0	31	0	37	68	51.29
Shih Tzu	5 (2)	24 (17)	6 (4)	28 (15)	63	51.90
Maltese	4 (4)	26 (10)	5 (3)	27 (11)	62	52.50
Miniature Schnauzer	4 (3)	28 (27)	5 (5)	25 (25)	62	53.09
Belgian Tervuren	22 (1)	11	17	8 (1)	58	53.65
Cocker Spaniel (English)	18 (3)	10 (2)	18 (2)	12 (3)	58	54.21
Pug	2 (2)	28 (20)	2 (1)	25 (21)	57	54.76
Weimaraner	8	22	9	18	57	55.31
Whippet	11 (1)	20 (2)	9 (1)	15 (2)	55	55.84
Brittany	2	28 (1)	4 (1)	19	53	56.35
Rat Terrier	3	21	10	19	53	56.86
Pembroke Welsh Corgi	4 (3)	24 (21)	2 (2)	22 (22)	52	57.36
Yorkshire Terrier	4 (4)	22 (19)	6 (4)	20 (19)	52	57.86
Pit Bull	5	19	2	25	51	58.35
American Staffordshire Terrier	5	22	2	21	50	58.83
Dalmatian	13 (1)	16 (2)	6 (1)	15 (2)	50	59.31
Chinook	9	7	20	13	49	59.78
Boston Terrier	3	27 (16)	1 (1)	16 (15)	47	60.24
Dachshund (Miniature)	4 (3)	20 (18)	2 (2)	19 (19)	45	60.67
Cavalier King Charles Spaniel	5 (2)	19 (16)	5 (4)	15 (14)	44	61.09
English Setter	13 (1)	11	10 (1)	6	40	61.48
West Highland White Terrier	5 0	20 (5)	1	14 (5)	40	61.86
German Shorthaired Pointer	9	12	2	16	39	62.24
Eurasier	11	5	10	12	38	62.60
Vizsla	9	14	7	8	38	62.97
Papillon	7 (3)	18 (9)	6 (6)	6 (6)	37	63.33
Poodle (Miniature)	2	17 (6)	3 (2)	15 (4)	37	63.68
Basset Hound	3	19	1	12	35	64.02
Bullmastiff	6	9	7	12	34	64.35
Cairn Terrier	0	22 (2)	0	11 (2)	33	64.66
Great Pyrenees	3	19	0	11	33	64.98
American Eskimo Dog	0	19	1	12	32	65.29
Belgian Sheepdog	7	10	8	6	31	65.59
Irish Setter	18	3	9	1	31	65.89
Miniature Pinscher	4 (3)	14 (10)	4 (4)	9 (9)	31	66.19
Saint Bernard	5	13	4	9	31	66.48
Alaskan Malamute	6	11	0	12	29	66.76
Lhasa Apso	1	12	0	16	29	67.04
Irish Wolfhound	13	9	3	3	28	67.31
Flat-Coated Retriever	3 (2)	7 (2)	8 (3)	9 (1)	27	67.57
Alaskan Husky	6	8	3	9	26	67.82
Chesapeake Bay Retriever	7	6	2	11	26	68.07
Poodle (Toy)	3 (2)	12 (9)	1 (1)	10 (10)	26	68.32
Redbone Coonhound	1	11	1	13	26	68.57
Staffordshire Bull Terrier	2	5	2	17	26	68.82
American Bulldog	3	14	1	7	25	69.06
Border Terrier	5	9 (1)	4	7 (1)	25	69.30
Bouvier des Flandres	7	8	3	7	25	69.54
Nova Scotia Duck Tolling Retriever	6	7	5	6	24	69.78
Chinese Shar-Pei	3	10	1	9	23	70.00
Australian Kelpie	6 (1)	5	1	10 (1)	22	70.21
Borzoi	10 (1)	3	6 (1)	2	21	70.41
Bulldog	3 (1)	4	4 (1)	10	21	70.61
Newfoundland	2	7	4	8	21	70.82
Afghan Hound	6	1	9	3	19	71.00
Fox Terrier (Wire/Wire-haired)	1	10 (1)	2	5 (1)	18	71.17
French Bulldog	0	9 (9)	2 (2)	7 (7)	18	71.34
Italian Greyhound	3 (3)	6 (6)	3 (3)	6 (6)	18	71.52
Treeing Walker Coonhound	1	10	0	7	18	71.69
Black and Tan Coonhound	2	5	3	7	17	71.85
Chinese Crested	3	7	2	5	17	72.02
English Bulldog	2	6	0	9	17	72.18
Norwegian Elkhound	2	5	1	9	17	72.35
Basenji	2 (1)	8 (1)	1 (1)	5 (1)	16	72.50
German Wirehaired Pointer	2	5	3	5	15	72.64
Kuvasz	4	5	5	1	15	72.79
Pekingese	1 (1)	8 (3)	0	6 (4)	15	72.93
Chow Chow	6	2	2	4	14	73.07
Scottish Terrier	4	6	2	2	14	73.20
Anatolian Shepherd	0	8	1	4	13	73.33
Cane Corso	1	2	3	7	13	73.45
Cardigan Welsh Corgi	2	5	2	4	13	73.58
Gordon Setter	5	2	6	0	13	73.70
Husky Mix	1	7	0	5	13	73.83
Parson Russell Terrier	1	7	2	3	13	73.95
Pointer	2	6 (2)	1	4 (2)	13	74.08
Schipperke	2	5	2	4	13	74.20
Bearded Collie	2	6	1	3	12	74.32
Collie (Rough)	2	5	1	4	12	74.43
Giant Schnauzer	2	3	2	5	12	74.55
Samoyed	1	3 (1)	3 (1)	5	12	74.67
Tibetan Terrier	2	3	4	3	12	74.78
Lagotto Romagnolo	5	0	4	2	11	74.89
Old English Sheepdog	0	9	0	2	11	74.99
Plott	0	7	0	4	11	75.10
American Foxhound	0	1	0	9	10	75.19
Fox Terrier (Toy)	0	4	1	5	10	75.29
Ibizan Hound	4	1	2	3	10	75.39
Irish Water Spaniel	5	1	4	0	10	75.48
Keeshond	2	5	0	3	10	75.58
Silky Terrier	0	4	2	4	10	75.68
Welsh Terrier	0	6	2	2	10	75.77
Collie (Smooth)	0	5	1	3	9	75.86
Blue Heeler	1	2	1	4	8	75.94
Bull Terrier	0	5	1	2	8	76.01
Fox Terrier (Smooth)	2	3	0	3	8	76.09
Standard Schnauzer	1	4	0	3	8	76.17
Blue Tick Coonhound	0	5	1	1	7	76.23
Brussels Griffon	0	4 (1)	1 (1)	2	7	76.30
Lurcher	1	4	0	2	7	76.37
Black Russian Terrier	2	2	0	2	6	76.43
Irish Terrier	3	1	0	2	6	76.48
Jindo	1	3	0	2	6	76.54
Kerry Blue Terrier	2	2	1	1	6	76.60
Norwich Terrier	0	3	2	1	6	76.66
Spanish Water Dog	2	1	1	2	6	76.72
Sussex Spaniel	1	3	2	0	6	76.77
Welsh Springer Spaniel	2	3	1	0	6	76.83
American Boxer	1	1	0	3	5	76.88
Australian Silky Terrier	0	4	0	1	5	76.93
Australian Terrier	1	3	0	1	5	76.98
Briard	0	1	3	1	5	77.02
Greater Swiss Mountain Dog	0	2	1	2	5	77.07
Irish Red and White Setter	3	0	1	1	5	77.12
Neapolitan Mastiff	0	2	0	3	5	77.17
Polish Lowland Sheepdog	1	4	0	0	5	77.22
Saluki	2	2	1	0	5	77.26
Affenpinscher	0	3	0	1	4	77.30
Clumber Spaniel	1	3	0	0	4	77.34
Eurohound Husky	1	1	2	0	4	77.38
Japanese Chin	0	1	0	3	4	77.42
Manchester Terrier (Toy)	0	1 (1)	0	3 (1)	4	77.46
Pharaoh Hound	1	2	0	1	4	77.50
Belgian Groenendal	1	1 (1)	0	1 (1)	3	77.52
Dogo Argentino	1	1	0	1	3	77.55
Lowchen	1	2	0	0	3	77.58
Manchester Terrier	0	1	0	2	3	77.61
Miniature Bull Terrier	1	0	0	2	3	77.64
Shiloh Shepherd	0	0	0	3	3	77.67
WGSD	0	2	1	0	3	77.70
American Water Spaniel	0	0	1	1	2	77.72
Bedlington Terrier	1	0	1	0	2	77.74
Bracco Italiano	0	0	0	2	2	77.76
Curly-Coated Retriever	2	0	0	0	2	77.77
English Foxhound	0	1	0	1	2	77.79
Field Spaniel	1	0	0	1	2	77.81
King Shepherd	0	2	0	0	2	77.83
Lakeland Terrier	0	1 (1)	1 (1)	0	2	77.85
Mudi	0	0	2	0	2	77.87
Petit Basset Griffon Vendeen	1	1	0	0	2	77.89
Scottish Deerhound	0	0	1	1	2	77.91
Silken Windhound	1	0	1	0	2	77.93
Spinone Italiano	1	1	0	0	2	77.95
Stabyhoun	0	0	2	0	2	77.97
Tibetan Spaniel	0	0	1	1	2	77.99
Wirehaired Pointing Griffon	0	0	0	2	2	78.01
Beauceron	0	0	1	0	1	78.02
Bloodhound	0	0	0	1	1	78.02
English Coonhound	0	0	0	1	1	78.03
German Pinscher	0	0	1	0	1	78.04
Icelandic Sheepdog	0	1	0	0	1	78.05
Komondor	1	0	0	0	1	78.06
Lancashire Heeler	1	0	0	0	1	78.07
Otterhound	1	0	0	0	1	78.08
Peruvian Inca Orchid	0	0	0	1	1	78.09
Portuguese Podengo	1	0	0	0	1	78.10
Puli	0	0	1	0	1	78.11
Sloughi	1	0	0	0	1	78.12
Swiss Mountain Dog	0	0	1	0	1	78.13
Teddy Roosevelt Terriers	0	0	1	0	1	78.14
Tosa	0	1	0	0	1	78.15
Mixed Breed/Unknown	71	1077	55	1067	2270	100.00
Total	**1226 (115)**	**4203 (502)**	**1084 (133)**	**3876 (484)**	**10389**	

The breeds written in bold letters were selected for the factor analysis. The numbers of selected dogs are shown in parentheses.
The shaded regions indicated the breeds accounted for 50% of all dogs in each country.