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Andrew N. Rowan  
*Tufts University*

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THE SUCCESS OF COMPANION ANIMAL MANAGEMENT PROGRAMS  
A HISTORICAL AND STATISTICAL REVIEW

Andrew N. Rowan and Alexandra K. Wilson  
Tufts School of Veterinary Medicine

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In the early 1970's a surge of articles in the lay and scientific press brought the burgeoning problem of pet overpopulation to the attention of the American public. The spark for this concern appears to have been an article by Carl Djerassi (who was prominent in the development of oral contraceptives for humans) and his colleagues in the unlikely forum of the Bulletin of Atomic Scientists. Djerassi argued that an efficient means of birth control was also required for the pet population (Djerassi et al, 1973). In 1974, following Djerassi's article Alan Beck, in an address to city officials described the metamorphosis of the dog from "man's best friend to a source of social, medical and political concern". In the same year, an editorial in the journal Science, (Feldman, 1974) claimed that the increasing number of unwanted and stray dogs were a cause of pollution, property damage, and danger to public health. Articles on it is issue appeared in many popular magazines, including Time, Esquire and Mad Magazine, and irresponsible pet ownership was implicated as one of the main causes of the wholesale destruction of unwanted animals . In general, the cat population was overlooked except by Robert Schneider (1970) who, in a study of pet population dynamics in two Californian communities, pointed out that the problem of overproduction in the more fecund feline population was even more acute than that in the canine population.

Once recognized as a concern, a wide spectrum of solutions were offered to curb the increasing number of unwanted cats and dogs. In its Report to Humanitarians, (Thomsen, 1974) the Humane Information Services stressed the need for a shift from "humane education" for pet owners to education of all members of the public as well as government officials to the need for effective animal control measures. Thomsen argued that new, urban oriented, locally based ordinances were needed which would focus on enforcement of responsible pet ownership rather than trying persuasion. This movement away from traditional education efforts was echoed by some participants at the National Conferences on Dog and Cat Control in 1974 and 1976, where the overall thrust may best be described by the mnemonic, LES (Legislation, Education, and Sterilization).

A decade and a half later, we find ourselves in a position to assess progress in the struggle to improve the welfare of companion animals in their relationship with humans. Although a great deal of effort has been expended to reduce the number of dogs and cats killed in the nation's shelters since

the early 1970's, there has been little real attempt to discover how successful (as a nation) our efforts have been nor to identify the most important factors responsible for what changes in companion animal demographics and shelter statistics may have occurred. In fact, even reliable basic demographic data is generally unavailable. Few local shelters conduct surveys to determine the local dog and cat population and the national scene is only marginally better serviced as a result of surveys conducted for pet product manufacturers.

In 1973, the Humane Society of the United States conducted a nationwide survey of shelters from which it concluded that 13.5 million dogs and cats were killed annually by shelters. A follow-up survey for the year 1982 indicates that this figure has fallen to 10 million. and it may be as low as 7.6 million. By contrast, the overall dog and cat population has grown from approximately 60 million in 1973 to approximately 92 million in 1983. Thus, as can be seen in Table I, the programs to reduce the population of unwanted dogs and cats have, in fact, had considerable success although we do not know what the critical factors responsible for this decline have been.

TABLE I

Proportion of the Total Number of Dogs and Cats  
Killed Annually in Shelters in the U.S.

	Total Population (millions)	Number killed (millions)	% Killed
1973	60.0 - 64.0	13.5	21.0 - 22.5
1982	92	7.6 - 10	8.2 - 10.9

SOURCES: 1973 Total population - Since no data is available on the nationwide dog and cat population in 1973, the results of the 1972 (low estimate) and 1975 (high estimate) surveys commissioned by the Pet Food Institute were used. 1983 Total population - Survey commissioned by American Animal Hospital Association. Numbers of Animals killed: Based on surveys of humane societies and animal control agencies on the HSUS mailing list. In 1983, 3,225 surveys were mailed and responses were received from 593 (18.4%). However, it should be noted that the HSUS estimates that there are only about 1,800 in the U.S.A., so many of the organizations which received the questionnaire were not shelters.

There are a number of difficulties to be faced if one wishes to clarify the factors affecting animal control and the size and fate of the shelter population. In his 1973 article in the Bulletin of Atomic Scientists, Carl Djerassi accurately pointed out the weakest link in the development and evaluation of effective animal control programs.

The first dilemma faced by the investigator examining the dog and cat population is the poor quality of numerical data even in those countries with an advanced humane census.

The situation is not much better today even though numerous studies to determine the national pet dog and cat populations have been commissioned by interested groups such as the American Veterinary Medical Association, the American Animal Hospital Association, and various pet food manufacturers. Because various methods of data collection and analysis are used in these surveys comparison of results from one study with those of another must be done with caution. As a result accurate trends in the pet population growth are difficult to determine.

A common approach used by some of the national and regional surveys, has been to relate the pet population to the human population on which more systematic information is gathered. A ratio of dogs to humans was developed by Nasser and Mosier (1980) and Schneider and Vaida (1975). Based on their respective studies on population dynamics in Manhattan, Kansas, and Alameda and Contra Costa counties, California, Nasser reported a ratio of 1:4.1 while Schneider gave a lower estimate of 1:7. However, it has been commonly assumed that there is one dog for every six persons and this formula is widely used to estimate the dog population. It is clear from the Nassar and Mosier and Schneider surveys that the 1:6 ratio cannot be generally applied.

Another commonly used formula for estimating the number of companion animals in a community is to determine the number of households owning pets and the average number of animals per household. The results of four surveys for the years 1975 and 1976 are given below in Table II.

TABLE II

Comparison of National Pet Demographic Surveys 1975 and 1976

		% Dog owning households	% Cat owning households
1975	National Analysts	43	22
	Pet Food Institute	39.6	22.6
1976	National Family Opinion	48	NA
	AAHA	43.4	20.2

The variation in the population estimates given by these and other research groups is probably the result of random variation, differences in sampling methods and differences in the phrasing of questions. Guy Hodge of the Human Society of the United States points out that variations in respondents' interpretations of a "pet" can have a significant influence on

survey results. Some people, for example, may include stray animals that they feed from time to time or barn cats. Others may not consider such animals as "pets". Some investigators have surveyed all households, while others have limited their interviews only to families, thus excluding single persons from their surveys. Another factor which may account for discrepancies between survey results is the high turnover rate in the pet population. Studies by National Analysts (1975) and Schneider (1975) indicate that cat and dog populations are in constant flux. Within one year 15% of the dogs and 25% of the cats will leave their households and only one third of dogs and cats remain in their original households for the duration of their natural lives. Despite these difficulties, the results from the market surveys presented in Tables III and IV indicate that there have been significant increases in the dog and cat populations over the last fifteen years.

TABLE III

Year	<u>Nationwide Dog Population 1972 - 1984</u>																			
	1972		1975		1976		1979		1980		1981		1982		1983		1984			
Source	AAHA	PFI	PFI	AAHA	PFI	F&S	PFI	PFI	AAHA	AVMA	KK	KK	AAHA	AVMA	KK	KK	AAHA	AVMA	KK	KK
# U.S. H'holds.	64.7	64.7	67.9	72.2	72.2	80.0	77.9	79.8	82.1	85.0	--	--	82.1	85.0	--	--	82.1	85.0	--	--
% H'holds owning dogs	39.6	38.0	42.4	43.4	41.6	40.0	40.0	41.0	41.0	42.3	38.2	--	41.0	42.3	38.2	--	41.0	42.3	38.2	--
# Dogs per H'hold	1.41	1.4	1.41	1.39	1.4	1.5	1.4	1.5	1.43	1.54	1.44	--	1.43	1.54	1.44	--	1.43	1.54	1.44	--
Total # of Dogs	36.1	34.4	41.3	43.6	42.0	48.0	43.6	49.1	48.1	55.6	46.2	46.0	48.1	55.6	46.2	46.0	48.1	55.6	46.2	46.0

TABLE IV

Year	<u>Nationwide Cat Population 1972 - 1984</u>																			
	1972		1975		1976		1979		1980		1981		1982		1983		1984			
Source	AAHA	PFI	PFI	AAHA	PFI	F&S	PFI	PFI	AAHA	AVMA	KK	KK	AAHA	AVMA	KK	KK	AAHA	AVMA	KK	KK
# U.S. H'holds.	64.7	64.7	67.9	72.2	72.2	80.0	77.9	79.8	82.1	85.0	--	--	82.1	85.0	--	--	82.1	85.0	--	--
% H'holds owning cats	21.0	20.8	21.5	24.5	23.8	20.0	24.1	26.5	27.0	28.4	26.2	--	27.0	28.4	26.2	--	27.0	28.4	26.2	--
# Cats per H'hold	1.88	1.9	1.58	2.07	1.9	1.7	1.8	2.0	1.98	2.16	1.97	--	1.98	2.16	1.97	--	1.98	2.16	1.97	--
Total # of Cats	25.5	25.6	23.1	36.6	32.6	27.2	33.8	42.2	43.9	52.1	43.3	45.3	43.9	52.1	43.3	45.3	43.9	52.1	43.3	45.3

SOURCES: AAHA - American Animal Hospital Association, PFI - Pet Food Institute, F&S - Frost and Sullivan, AVMA - American Veterinary Medical Association, KK - Kal Kan Pet Food Manufacturers. See Appendix A for details on survey methodologies.

Many animal control agencies rely on the estimates provided by national and regional studies to determine their own pet populations. The danger inherent in such extrapolations, besides the wide variations in the nationwide statistics available from different sources, is illustrated by the conclusions of a market survey by the Upjohn corporation (Bush, 1978). Results from a survey of 12,000 people nationwide revealed variations of up to 16% in pet ownership between various regions of the country. A more recent study of pet ownership by Charles, Charles Associates (1983) showed that many socio-economic factors such as income, type of dwelling, family size, and type of community (urban, suburban, rural) are important determinants of pet ownership. They also confirmed substantial variations in pet ownership from one state to another. In this proceedings, John Kullberg of the New York City ASPCA argues that the dog population in New York City is only about one third of what might be expected by applying of the Charles, Charles, Associates (1983) formula. Lloyd Ross of the Baltimore Bureau of Animal Control also reports that the number of cats per household in Baltimore is much smaller than might be expected from national surveys.

#### Animal Control Workshop

In order to try and come to better grips with some of these problems and to assess the impact of educational, legislative, and population control measures on human and animal welfare, a number of experts were brought to a workshop to focus their collective wisdom on the issues of population control and animal management. Only those papers from the workshop that have been submitted are represented in this proceedings. Like the scientists and animal welfare advocates of the 1970's, panelists attributed most of the problems of animal overpopulation in the 1980's to irresponsible owners. This designation was used to describe the large number of people who, having casually acquired a pet, are unwilling to assume responsibility for its' behavior and whereabouts. These casual owners too often surrender or abandon their animals once they have outgrown their "cuteness" or, through neglect, have acquired undesirable behavioral traits. However, as Table I indicates, the animal control problem of the 1980's appears to be both proportionately and absolutely less severe than it was in the early 1970's. Fewer animals are ending up in the nation's shelters despite a much larger dog and cat population. However, it is not clear what factors have been responsible for the possible changes that have occurred.

#### The Shelter Population

Both Phil Arkow and Lloyd Ross cited the young age of the shelter population in comparison to the general dog population in their communities. A review of the Pikes Peak shelter in Colorado revealed that the majority of dogs were 6-18 months of age with larger and mixed breed animals disproportionately represented. This later finding is consistent with studies by Nassar et al, (1984) and Arkow and Dow (1984) which correlated the cost of a pet with the degree of owner commitment to it. Based on surveys of the pet

owning community in Baltimore, Ross found the shelter population to be an average of three years younger than the general population.

With the exception of Vancouver, which had a redemption rate of 40% in 1976, shelters reported that few impounded animals make it back to their original homes. Overall redemption rates for dogs and cats ranged from as low as 4.02 % in New York City to 15% in Palm Beach, Florida. These figures are similar to those described by Nassar and Mosier (1984) who reported that only 20.4 % of the dogs and 7% of the cats in the Las Vegas area were reunited with their owners.

### Enforcement

The importance of animal related problems in the public mind became evident when a survey of U.S. mayors ranked animal related issues first among complaints received by their offices in 1974 (Bancroft, 1974). Nine years later, these concerns still ranked third in Baltimore City Hall, yet relatively little has been done to augment the enforcement of city ordinances. Some local governments have increased their budgets for animal control (e.g. West Palm Beach, Florida and Charlotte, North Carolina) but, in general, the low priority status given animal control problems by local government, and the lack of serious attention by the judiciary to offenders have slowed what progress has occurred. In Boston, a city of nearly 600,000, there has been virtually no animal control since the Animal Rescue League gave up the city contract after years of trying to get the city to put adequate resources into the animal control program.

In certain instances, the situation has deteriorated despite the efforts of animal control agencies to gather more local support. Over the past ten years, New York City has experienced a drop of 20% in the number of dog licensed. While this might be interpreted as an optimistic sign indicating a decline in the population, officials take gloomier view that it is probably due as much to a drop in the licensing rates to a true decrease in the size of the population. In addition to the closure in 1982 of three out of the five city shelters, the city turned over responsibility or licensing to the ASPCA, a private humane society. John Kullberg of the ASPCA in New York, believes that this has resulted in a reduction in the licensing compliance rate because the ASPCA officers are not perceived as having as much authority as the city officials.

There have been some successes, however, in the effort to improve the effectiveness and enforcement of the laws governing animal control. Strategies have included issuing citations to owners (instead of impounding animals), reserving specific court dates for violators of animal control ordinances, and imposing stiffer fines on irresponsible owners. For example, the Atlanta Humane Society found the judiciary its greatest problem in trying to improve observance of animal ordinances. However, they worked out an arrangement whereby animal control problems would be dealt with by specific courts on designated days. Recognizing the need for strict enforcement, one Atlanta

judge now routinely fines owners of roaming animals \$200.00, granting suspensions only for the costs the defendant incurs in fencing to control their dog.

The Charlotte Animal Control Division, worked out a similar arrangement with the courts to set aside one day a week for animal control violators. The division also now requires owners to sign a contract agreeing to sterilize adopted animals or risk reclamation because it had a high "no show" rate for sterilization operations for shelter adopted kittens and puppies. While it is too early to judge the program's success, this strategy appears to be working since the sterilization delinquency rate has dropped from 30.7 to 5.9 percent.

Many shelters have taken measures to shift punishment for violations from the pet to the owner. This "punishment" may come in the form of higher impoundment fees, or as is the case in Colorado Springs, Colorado and Pima County, Arizona, replacing impoundments with owner citations. This change was deemed necessary in the face of the low redemption rates mentioned earlier. Arthur Ruff of the Pima County Animal Control Center believes that a special effort by the Center to identify and cite owners of roaming and/or unlicensed dogs has been instrumental in reducing the number of dog bite reports by 12% in one year.

#### Spay/Neuter Programs

The issue of publically subsidized spay/neuter programs has been a major focus of debate, fractionating interested groups and often resulting in the polarization of humane societies and veterinary associations into opposite camps. Participants at the two National Conferences on Dog and Cat Control in the mid 1970'S concluded that "the building of tax-supported facilities is strongly discouraged" and instead advocated cooperative efforts by animal welfare groups, government and local veterinary associations to use existing or mutually funded facilities. Some opponents have argued that low-cost programs do little for the people they are supposed to help, mainly attracting those who can afford standard surgical fees. Strong criticism came from Alan Beck (1974) who stated:

Implicit in these proposals (for municipally financed sterilization clinics), however, is a tacit encouragement of permitting sterilized animals to run free. Such animals still bite, turn over garbage cans, bark, defecate, and get hit by cars. If leash laws were strictly enforced, pets would not get pregnant. Of course, there are irresponsible owners, who do not supervise their animals, but there is no evidence that these people would avail themselves of non-profit sterilization clinics anyway.

Another critic of mass spay/neuter programs was Robert Schneider (1975) who concluded, from data collected on pet population dynamics in Alameda and

Contra Costa counties in California, that such programs will not have their desired effect.

The critical factor in maintaining canine population balance is the law of supply and demand. As demand increases, prices increase and additional pups become available through more breeding activity, both planned and unplanned. This increased productivity becomes an excess when demand recedes. The major way to control overproduction is to regulate demand more closely. A way to regulate demand is to educate potential owners as to their responsibilities if they obtain a pet, not by offering them low-cost neutering services. Such services will only make them complacent.

Part of Schneider's skepticism regarding the efficacy of such programs is based on his findings regarding the high turnover rate in the pet population. In the two counties studied, such a large number of pets left the households yearly that, by the end of three years, only 33% of the female cats and 50% of the female dogs remained in their original homes. Analysis of age related spay rates revealed that the highest proportion of spayed animals are in the older age brackets. Schneider attributes the reluctance on the part of the owner to have their pet spayed during its prime reproductive years to the high probability of that animal not staying long in the household.

To be fair, most advocates of low-cost spay/neuter programs also have promoted stronger enforcement of animal control ordinances and have supported education programs for pet owners. For example, while recognizing that sterilization programs are not the complete answer to the pet overpopulation problem, Guy Hodge, of the Humane Society of The United States, (1976) felt that such programs were in part responsible for decreasing reproduction rates of the early 70's. Hodge disagreed with those who thought that sterilization programs increased owner irresponsibility and argued that sterilization represented a proprietary investment in an animal which would increase responsible ownership. In addition, he pointed out that sterilization would have the benefit of elimination of estrus and related behavioral activities which, he stated, was the primary reason 35% of all dog owners gave their animals away.

During the 1970's many advocated the need for differential license fees for sterilized animals as a means to encourage such practices, (Schneider, 1975; Thomsen, 1974; Council on Veterinary Services, 1973). This feeling, however, was not universally held. Some felt that it was inappropriate to impose a fine that would indiscriminately punish owners, regardless of the responsibility that they exercised in regards to their pet. This concern was voiced by Alan Beck (1974), who argued that:

There is no reason to increase the license fee for intact animals if the owner realizes that the animal must always

be supervised. To do so would be to levy a fine before the law is violated. Appropriate fines should be charged only after a straying animal is captured.

Nevertheless, such differential fees are not unusual in other areas of public activity and they are legitimate means for promoting what is perceived to be desirable public behavior.

The debate over the efficacy of sterilization clinics was continued at this conference. Phil Arkow, comparing the situation now in Colorado Springs with that in the early 1970's, noted an encouraging decrease in the numbers of unwanted animals from 24.1 to 13.5% of the estimated total population. Arkow's optimism however, is guarded, and he questions whether the root of the problem, namely, owner responsibility and commitment to their pets has been affected. Arkow's ambivalence about the effectiveness of sterilization programs results in part from the fact that so few animals are successfully recycled back into the community from the shelter. With only 4% of the dogs, and 2% of the cats in the general population coming from the shelters (Nassar et al, 1984), it is difficult to imagine how shelter requirements for sterilization could substantially influence the pet population growth in the community.

Arkow is also pessimistic about the impact of free sterilization programs on curbing population growth. "Program 200" a free pet sterilization program offered to welfare recipients by the Colorado Springs Animal Control Department, was discontinued after one year due to lack of participation. Arkow believes this was in part due to the low percentage of pet owners in the lower income brackets, a statistic which is supported by various national and regional surveys. Dennis Moore of the Palm Beach Animal Regulation Division feels, however, that cost can be an important factor in an owner's decision to sterilize their pets. A survey in Palm Beach found that 74% of the participants in a sterilization rebate program, slightly under half of which were in the \$20,000 per year income range, felt that the availability of a low cost program was important or very important in their decision to sterilize their pet.

Dianne Quisenberry of Charlotte, North Carolina, whose municipal clinic opened in 1982, is still waiting for more data to determine the effect of their sterilization program on the pet overpopulation problem. Because of the higher cost of shelter animals with the advent of mandatory sterilization, the shelter experienced a substantial decline in the adoption rate which is now slowly recovering. Quisenberry views the reduction in the adoption rate as a positive development, however, since it screens out potentially uncommitted owners. Although cautious to draw conclusions at such an early date, Quisenberry cites a decrease in the number of animals surrendered to the shelter as suggestive evidence of their program's success. Lloyd Ross cited a similar decrease in the adoption rate with the institutionalization of mandatory sterilization. In Baltimore, the number of shelter adopted animals decreased from 560 in 1978 to 291 in 1982.

35,000 Animals have been sterilized by ASPCA veterinarians and an undetermined number by participating veterinarians in a sterilization program operated by the New York City ASPCA. In the same time span, the number of animals turned into shelters has dropped 47%. John Kullberg warns, however, that attributing this decrease to the implementation of the sterilization program ignores the influence of other dynamic processes such as the state of the economy, lease constraints, and life style changes.

Following a bad period in the early 1970's in which the dog population doubled and the numbers of dogs and cats impounded reached catastrophic proportions, the British Columbia SPCA believes that they are reaping the benefits of their new animal control program. This program involved the establishment of increased impoundment fees, differential licensing for sterilized animals, mandatory sterilization and tattooing for shelter adopted animals, and the establishment of a low-cost spay/neuter clinic. These measures are believed to be responsible for the decline in the number of euthanasias (from 80,000 in 1976 to 8,986 in 1983), of animal related complaints, and of the number of dead and injured animals picked up by shelter staff.

The implementation of mandatory tattooing for shelter animals and the voluntary tattooing of dogs by local veterinarians under the banner of "Operation Tattoo", is felt to be one of the most effective measures undertaken by the BCSPCA to increase owner responsibility. In comparison to non-participating municipalities, which have experienced an increase of 27% in the number of dog impoundments, communities which have adopted Operation Tattoo have had a decrease of 7% over a six year period. In addition, in the District of North Vancouver which accepted the program, there has been an increase of 46% in the proportion of impounded animals reclaimed by their owners.

Robert Rush of the Los Angeles Department of Animal Regulation believes a combination of a low cost sterilization program and differential licensure has been a (if not the) key factor in decreasing the number of animals impounded in Los Angeles by 50%, from 144,000 in 1970 to 72,454 in 1982-83. However, during the same period, the number of licensed dogs declined from 266,325 to 181,852 (a 32% drop). Without accurate statistics on the actual pet population it is difficult to determine whether the fall in dog licenses reflects the actual number of dogs in the population and, therefore, whether the large drop in impoundments is a feature of population changes or is caused by the spay/neuter and enforcement program. However, the spay/neuter program has had a major impact on the reproduction status of the animal population. From 1972 to 1980, the proportion of licenses issued to sterilized animals grew from 11% to 48%. Other dynamic factors, such as changes in the local human demographics, also need to be considered when evaluating the efficacy of any animal control programs. In the San Fernando Valley, a shift to multi-family dwellings and condominiums is likely to decrease the demand for dogs. This was illustrated by the Charles, Charles,

Associates survey (1983) which found a positive correlation between possession of pets and home ownership. The ethnic demographics of Los Angeles have also undergone a significant transformation in recent years. Most importantly, the Hispanic population has increased 9.0% in the past ten years. Considering the high number of undocumented aliens now living in the Los Angeles area, the actual percentage is probably higher. With pet ownership among Hispanic people currently below the national average (Levine, 1984), this change in the local demographics may also have altered the demand for pets.

Several surveys conducted in the last decade and a half have helped unravel some of the determinants of pet ownership. Family size, number of children, home ownership versus renting, and type of household dwelling all have an impact on pet ownership. Investigators have explored attitudes of pet owners toward their animals and are just beginning to determine the reasons why people acquire pets (security, companionship) and why they gave them up in often startling numbers (behavior problems, unrealistic expectations).

In spite of numerous studies, however, we are still in the dark about the actual effectiveness of various programs which have been implemented to combat the problems of irresponsible owners and unwanted dogs and cats. Lack of information on why people sterilize their animals and the importance of financial considerations in their decision makes it difficult to plan and evaluate spay/neuter programs. While studies in the early 1970's looked at attitudes of pet owners and non-pet owners on animal control programs no recent studies have been undertaken.

A basic requirement for any program design and evaluation is access to accurate numerical information on the pet population. As discussed previously, this information is generally lacking on a local level and subject to wide variation on a national level Phil Arkow, reviewing the progress of Animal control programs in dealing with the plight of unwanted animals concludes:

A decade later, it is safe to say that the intakes of unwanted animals at the shelter have decreased, and that the public awareness of the advantages and availability of pet sterilization has increased, But whether either pathway, or even the combined efforts of both, have solved the "surplus" problem, or have at tacked the root of the problem - namely, changing pet owner's values to foster a sense of responsible pet ownership and encouraging owners to make a lifelong commitment to their wards remain to be seen.

## APPENDIX A

Below are brief descriptions of the methodologies employed in the market surveys whose results appeared in Tables I, III and IV.

Kal Kan - These figures are based on various surveys contracted by Kal Kan Pet Food Manufacturers, but primarily on a written survey sent out to 13,500 households. Although these households were selected to reflect U.S. population demographics, certain alterations of the data were made by researchers at Kal Kan to adjust for certain demographic groups which they felt were under-represented. (Note, however, that prior to 1984 single person household were not surveyed and no adjustment were made for this omission.

AVMA - In 1983 the AVMA commissioned Charles, Charles Associates for a one time survey on companion animal demographics. These results are based on responses of 13,500 people to a mail survey by N.F.O. (formerly National Family Opinion) on pet demographics. Like the survey commissioned by Kal Kan, these households were selected to reflect U.S population demographics. Single person households, however, were included and no adjustments of the data were made. The number of households owning dogs and cats were arrived at by multiplying the number of households in the U.S. by the percentage of households surveyed which owned dogs/cats. This number was then multiplied by the average number of dogs/cats per household to determine the nationwide dog/cat populations.

Pet Food Institute - No information was available at the time of publication on the survey methods used in the studies performed in 1972, 1976, 1980, and 1981 except that the surveys were contracted out to the Market Research Corporation of America which used a "national consumer panel" for its study. The 1975 survey, however, was carried out by National Analysts, a subsidiary of Booz, Allen, Hamilton using the following methodology as described by Wilbur (1976).

This survey consisted of personal interviews with 1200 adults...Interviews were done in 57 urban, suburban and rural localities. Small areas within these cities or areas were randomly sampled, with the interviewer required to obtain a quota of interviews with each different respondent (dog owners, cat owners, former pet owners, and people who had never owned pets) in each area.

American Animal Hospital Association, Frost and Sullivan - Details of the survey methodology used in these studies were not available at the time of publication.

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