

Winn Feline Foundation Progress Report

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Feline upper respiratory disease and shelter dynamics

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Funded 2000

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One of the most significant problems in animal shelters is the devastating impact of feline upper respiratory tract disease (URTD). These infections, most commonly caused by feline herpesvirus (FHV-1) and feline calicivirus (FCV), are a major cause of illness and death (whether natural or due to euthanasia) in shelters. Many factors contribute to the high incidence of URTD in shelters, including lack of vaccinations before entering the shelter, stress, declining maternal antibodies, malnutrition, injuries, or other diseases. In addition, factors involving the shelter environment itself play a role, such as high cat densities, and high concentrations of infectious agents. Vaccines against FHV-1 and FCV provide protection against severe disease, but cannot prevent infection or viral shedding. A complicating factor is that vaccination using intranasal (IN) vaccines can cause signs similar to natural URTD.

The ubiquitous nature of the URTD agents, the stress in animal shelter environments, less than perfect vaccines, and other factors make it impossible to eliminate URTD totally. Instead, shelters concentrate on reducing the incidence of URTD as much as possible. Despite the acknowledged problem, little data has been generated about the actual incidence of URTD in shelters, or the factors that put certain shelter cats at high risk.

The researchers had 3 main objectives:

- 1) To estimate the incidence of URTD in a particular shelter
- 2) To identify risk factors for URTD in the shelter
- 3) To estimate the proportion of cats euthanized due to URTD in the shelter

The study shelter is located in the northeastern United States and is an open-admissions shelter that impounded approximately 6,900 cats during the study period. Of these 6,900 cats, 36% were adopted, 59% were euthanized, and 5% were transferred, returned to the owner, dead on arrival or fostered.

During the 50-week study period, each cat was observed for typical signs of URTD. Kittens were tracked either as individual kittens, or as a unit consisting of an entire litter. Other data collected included age at entry to the shelter, time of year, gender, breed, source, indoor/outdoor status, vaccination history if available, and whether declawed. On admission to the shelter, all cats are normally vaccinated with Heska[®] trivalent vaccine

for FHV-1, FCV, and panleukopenia within 24-48 hours. When the Heska[®] vaccine was unavailable, a small number of cats (3%) received an injectable vaccine for the same agents by Fort Dodge[®]. During the study period, a change in management of the shelter caused some cats (up to 36%) to remain unvaccinated inadvertently, and these cats were also evaluated.

During the study period, a total of 3435 cats and litters of kittens were studied, including 701 litters of kittens, 531 individual kittens, and 2203 adult cats. URTD was seen in 33% of litters of kittens, 26% of individual kittens, and 30% of all adults. Kittens had a significantly higher risk of developing URTD than adult cats. The cats were further broken down into two groups based on time of occurrence of signs of URTD. Cats becoming ill within the first 5 days in the shelter were thought likely to have arrived already incubating disease. Cats that became ill after 5 days in the shelter were thought to have acquired their URTD in the shelter environment.

Among kittens becoming ill during the first 5 days, the most important factor was vaccination. Kittens that received the IN vaccination were significantly less likely to show signs of URTD than unvaccinated kittens. As well, kittens vaccinated with the IN Heska[®] vaccine were less likely to become ill than kittens vaccinated with the injectable Fort Dodge[®] vaccine. However, the same effect was not seen with adult cats. Vaccination was not associated with lowered risk of disease in adults. Among adults, the most important risk factors were age (cats over 11 years old were at higher risk), source (stray cats were at higher risk), breed (purebred cats were at higher risk), and season (cats entering the shelter during January - March were at higher risk).

Risk factors for development of URTD after 5 days in the shelter were different. Among litters of kittens, the older ones (4-6 months of age) had higher risk than kittens under 8 weeks old. Kittens surrendered to the shelter by owners had a higher risk than kittens from stray cats. Kittens entering the shelter during April - June had the lowest risk of URTD. Vaccination of kittens upon entry into the shelter did not appear to be protective for URTD after 5 days. Adult cats also experienced the lowest risk if they entered the shelter between April - June as well as between July - August. Adult cats (1-4 years old) had a higher risk of URTD than younger cats. Interestingly, injectable vaccination significantly reduced the risk of URTD among adult cats compared with those cats receiving the IN vaccine.

Researchers also examined what happened to cats and kittens that developed URTD while in the shelter. Overall, 50% of individual kittens and 64% of adult cats with URTD were euthanized. Forty-two percent of kittens with URTD were adopted, 35% of litters had at least one kitten adopted, and 31% of adults were adopted. Cats and kittens that never showed signs of URTD had higher adoption rates: 64% of individual kittens, 45% of litters, and 34% of adults.

The risk factors involved in development of severe URTD were also examined. Severe URTD was defined as secondary bacterial involvement, with mucopurulent or bloody nasal and/or ocular discharge and other signs such as sneezing. Individual kittens were

the group with the highest proportion of severe URTD cases. Litters of kittens had an intermediate frequency, and adult cats had the lowest frequency of severe URTD. IN vaccination showed a strong protective effect against development of severe URTD in both individual kittens and litters of kittens. IN vaccination of adult cats also reduced the risk of severe URTD, but not as dramatically as for kittens. Intact males were twice as likely to develop severe URTD compared to neutered male or female cats, and purebred cats were almost 5 times more likely to develop severe URTD compared with non-purebred cats.

The data from this shelter study showed that approximately 1 in 3 cats entering an open admissions shelter will develop URTD signs, and as many as 1 in 5 will be euthanized as a consequence. It may be important to pay special attention to cats at particular high risk of URTD in shelters, such as kittens, aged cats and purebred cats. The information generated by this study may also be partly applicable to breeders combating endemic URTD in catteries.

Millions of cats are euthanized as either a direct or indirect consequence of URTD in United States shelters. There is a great need for funding to research effective management strategies and for the resources to implement them in shelters. The Winn Feline Foundation has also facilitated funding for Dr. Scarlett and her colleagues to study non-traditional housing in shelters and its impact on URTD via a grant from the Miller Trust awarded in 2003.