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PRESIDENT'S MESSAGE

This Super Summer issue of *Westie Wellness* focuses on our role as breeders/owners regarding health issues/diseases that affect Westies. An important part of the Westie Foundation of America's (WFA) mission is to provide factual information to educate Westie breeders and owners, empowering you to improve the health and well-being of your Westies. Our goal is to communicate clearer and more often to our donors as well as to breeders, owners, and veterinarians, and we hope the information provided in this publication will help us keep you informed.



Bebe Pinter

In this issue, read about practices for Westies in New Zealand by reviewing the Health Report, New Zealand Kennel Club Accredited Breeders Scheme. Relative to the United States, two first-rate articles follow: "Responsible Breeding and Management of Genetic Disease," by Jerold S. Bell, DVM and breeders can learn how to successfully apply health clearance data to their breeding programs with "Collecting and Utilizing Phenotypic Data to Minimize Disease: A Breeder's Practical Guide," by Rhonda Hovan.

In the Spring issue, we listed five research projects for 2011. As you may remember, the Foundation collaborates with the AKC/Canine Health Foundation and Morris Animal Foundation on numerous grants. For those reports designated not confidential, we report them in their entirety; confidential scientific reports are carefully summarized to safeguard sensitive information.

Included are two continuing grant progress reports and a summarized report:

- (1) "Association Mapping Study of Legg-Calve-Perthes..." (a 12 month progress report);
- (2) "Mucosal Gene Expression Profiles in Canine Inflammatory Bowel Disease" (a 30 month progress report); and

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(3) "Canine Atopic Dermatitis-Relation to Epidermal Anti-Microbial Gene Expressions."

As any owner knows, it does not take very long for a special dog or bitch to become a canine soul mate. If asked about those dogs that have already crossed Rainbow Bridge, we easily recall stories that bring both laughter and tears. Never to be forgotten are the diseases that were courageously battled by our Westie friends and finally lost. After such devastating loss, we vow to do what we can to stop it from happening again to another of our Westies or anyone else's dog. The WFA was founded for that reason and came into existence as an advocate for improving the health of all Westies.

Please support efforts to study, treat and eradicate disease in our precious breed. Remember your gift to the WFA is always valued, carefully used, and tax deductible (www.westiefoundation.org).

We sincerely hope that you enjoy the Super Summer Issue 2011 as much as we have enjoyed compiling it for you.

Bebe Pinter

Health Report

New Zealand Kennel Club Accredited Breeders Scheme

By Kay McGuire, DVM, MS, VP of Health

The new Breeders of Merit program through AKC now has a sister program being initiated in New Zealand. New Zealand has an Accredited Breeders Scheme which was highlighted in their *Dog World Magazine*. **For the complete article, please visit www.westiefoundation.org.**



The new voluntary system allows breeders that have received accreditation to be recognized by the use of a logo for websites, business cards, etc. The website will be developed to include the list of health tests and the breeding recommendations of the New Zealand veterinary profession.

An "Accredited Breeder" will ensure that all breeding stock is registered in the New Zealand Kennel Club (NZKC), all breeding stock must be microchipped or tattooed, and have all health screens recommended by the NZKC. Puppies will be socialized and sold with written advice, immunization records, a sales contract, and any provisions for refund or return and replacement of puppy will be outlined.

The NZKC has a code of ethics that includes the age of breeding, frequency of litters, number of litters and prohibits tight inbreeding. All mandatory health tests pertaining to the breed must be done on the sire and dam and copies of these results presented to puppy buyers.

As the WHWTCA and WFA recommend, the NZKC recommends hip, patella and eye clearances in Westies. There are additional tests required which include those for Pyruvate Kinase Deficiency and Globoid Cell Leukodystrophy. A complete list for all breeds included in the article can be found at www.westiefoundation.org.

The Westie Foundation of America, Inc. is a nonprofit corporation, recognized by the IRS as a 501 (C) (3) organization. The mission of the Foundation is to provide financial aid and other support for medical research in order to benefit the health and quality of life of West Highland White Terriers; and to further develop and communicate information regarding the health, care, breeding and quality of life of Westies to Westie owners, Westie breeders and veterinarians.

Responsible Breeding and Management of Genetic Disease

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Breeders and Breeding

Breeders of dogs and cats desire to produce the best with their matings. However, breeding has become more complicated today, and more people with intact dogs and cats are becoming “breeders.” Understanding breed characteristics, historical selection parameters, and the continuous evolution of health testing has not been as important in the development of today’s breeders. It is up to all veterinarians, breeders, and breed associations to educate prospective breeders on these aspects to promote healthy breeding practices for dogs and cats.

Adding to the complexity of breeding is the expansion of planned cross-breeding (designer breeds) to produce offspring. Recently this has become more of a factor in dog breeding than cat breeding, but it does occur in both. Therefore, the discussion is no longer between pure-bred and cross-bred, but between purposely-bred and random-bred dogs and cats.

There is a general misconception that mixed-breed dogs and cats are inherently free of genetic disease. This may be true for rare, breed-related disorders; but the common genetic diseases that are seen across all breeds are seen with the same frequency in mixed-breeds. A mixed-breed dog with hip arthritis has no less a case of hip dysplasia than a pure-bred dog. The only difference is that conscientious breeders test and

label their dogs as dysplastic prior to the onset of clinical signs. I do not see a difference between the relative frequencies of old pure-bred dogs versus old mixed-breed dogs with hip arthritis requiring arthritis pain medication.



Testing for inherited hypothyroidism (for thyroglobulin autoantibodies by Michigan State University) shows 10.7% of 55,053 tested mixed-breed dogs to be affected. The average percentage of affected dogs for all pure breeds is 7.5%. This does not tell us that mixed-breed dogs are more prone to autoimmune thyroiditis: More mixed-breed dogs are tested based on clinical signs. However, these results show us that this hereditary disorder is seen frequently in both pure-bred and mixed-breed dogs. To those that feel that this disorder is not genetic, we look at the historical breed predilections for the disorder. Those breeds with the highest genetic propensity for autoimmune thyroiditis remain high

over the years (example: 31.4% of English Setters tested), and those breeds with the lowest propensity remain low (example: 1.1% of French Bulldogs). Selection based on thyroid testing (and in the future direct genetic tests for liability genes) should reduce the frequency of this disorder.

In cats, the most frequent genetic disorder seen in practice is feline lower urinary tract disease (FLUTD), also known as feline urological syndrome (FUS). This genetic disorder affects the metabolism of normal levels of magnesium and other minerals in the diet, causing urinary crystals, bladder and urethral irritation, and secondary infection. This disorder occurs in pedigreed and random-bred cats with equal frequency. The most frequent single-gene disorder seen in practice is polycystic kidney disease (PKD), caused by an autosomal dominant gene. This defective gene is present in a high frequency (38% testing positive at the UC-Davis Veterinary Genetics Laboratory) in Persian and Himalayan cats. Due to its dominant inheritance, PKD is also seen in Persian and Himalayan cross-bred or random-bred cats, and is not a rare presentation in clinical practice. Other common genetic disorders in cats include hypertrophic cardiomyopathy (where direct genetic tests are available for the Maine Coon Cat, Ragdoll, and their crosses), patellar luxation, and hip dysplasia.

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(Responsible Breeding continued from page 3)

The most common inherited disorders for all dog breeds according to the AKC Canine Health Foundation are: cancer, eye disease, epilepsy, hip dysplasia, hypothyroidism, heart disease, autoimmune disease, allergies, patellar luxation, and renal dysplasia. With the exception of renal dysplasia, all of these genetic conditions are routinely seen in mixed-breed dogs.

There are some defective disease-causing genes that mutated so long ago, that the mutation (and its associated disease) is found in evolutionary divergent breeds. The same ancestral autosomal recessive mutation for the progressive rod cone degeneration (prcd) form of progressive retinal atrophy (PRA) is found in the American Cocker Spaniel, American Eskimo Dog, Australian Cattle Dog, Australian Shepherd, Chesapeake Bay Retriever, Chinese Crested Dog, English Cocker Spaniel, Entelbacher Mountain Dog, Finnish Lapphund, Golden Retriever, Kuvasz, Labrador Retriever, Lapponian Herder, Nova Scotia Duck Trolling Retriever, Poodle, Portuguese Water Dog, Spanish Water Dog, Stumpy Tail Cattle Dog and Swedish Lapphund. This list continues to grow as more breeds are discovered with the same defective gene. The question is not, "Which breeds carried this defective gene during their development", but "Which breeds did not lose this defective gene during ancestral development."

It is also not surprising that prcd-PRA affected dogs (who must receive the defective gene from both parents) have been identified in Labradoodles (Labrador x Poodle crosses), and Cockapoos (Cocker Spaniel x Poodle crosses). Labradoodles are also being diagnosed with hip dysplasia, elbow dysplasia, and inherited Addison's disease; all recognized disorders in both parent breeds.

So, if breeders desire to produce the best with their matings, the basic question in dog and cat breeding becomes; "Who is a reputable breeder?" For purposely-bred dogs and cats (both pure-breeding and mixed-breeding), it is those breeders who perform genetic testing for breed-susceptible disorders. Official test results should be made available to prospective breeders, and the pet and breeding-stock purchasing public. It doesn't matter whether a breeder is a large commercial breeder, or only breeds once. In today's environment, not testing for documented breed-related hereditary diseases is irresponsible breeding.

Responsible breeding also involves knowledge of how best to use the results of genetic testing. For pure-breeds there are concerns about the breadth of the available gene pool and genetic diversity. Genetic test results should be used to benefit the overall health of breeds, not to limit it. A discussion of these issues, and breeding recommendations for genetic disorders based on different modes of inheritance are included in the 2007 Tufts' Canine & Feline Breeding and Genetics Conference poster abstract; Genetic Testing and Counseling: A Trojan Horse for Dog and Cat Breeds? (www.vin.com/tufts/2007).

Genetic Test Results and Genetic Registries

For direct genetic tests, official test results of the parents, and/or the offspring (tested prior to placement) should be made available to prospective breeders or purchasers of pet or breeding dogs and cats. For some breed associations, the results of genetic testing are available in on-line, publicly accessible databases.

For disorders where there is no direct genetic test available, the knowledge

of phenotypic test results (for affected, or carrier status if possible) should be made available in open health database registries. For most of these disorders, it is only through the open reporting of affected dogs and cats that knowledge of disease risk can be identified through the test results or health status of close relatives.

The Orthopedic Foundation for Animals (OFA: www.offa.org) maintains semi-open health registries for testable genetic disorders of dogs and cats. Applications for all of the hereditary disorders in their databases include a check-off to openly report ALL test results; both normal and abnormal. For many breeds of dogs tracking hip dysplasia for example, over one-third of the applicants check the box for open reporting. **It is important that as breeders and veterinarians we encourage open reporting of health results.** The days of stigmatizing conscientious, health-testing breeders who have produced dogs or cats with hereditary disease are gone. No one wants to produce affected offspring from their matings, and no one should be blamed if this occurs (unless the breeder is not doing the recommended health testing). It should be everyone's goal to produce healthy offspring, but this is not possible if the only available health information is about normal dogs and cats, but not abnormal dogs and cats. Once the majority of owners are initialing the box for open reporting, the OFA can change it to a check-off box for not reporting abnormal test results.

The Canine Health Information Center (CHIC: www.caninehealthinfo.org) was established by the AKC Canine Health Foundation and the OFA to assist breeds with managing breed-

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specific genetic disorders. The AKC national breed clubs determine the recommended testable disorders for the breed (whether tests of the phenotype or the genotype). If an owner is contemplating breeding their dog, they can look up the recommended genetic tests to perform in their breed. Veterinarians can also assist prospective breeders by looking up and discussing the recommended genetic tests for the breed. Prospective breeding dogs (in either pure or cross-breeding) can be researched, and their genetic test results, as well as that of their close relatives can be studied.

The benefit of the CHIC system is that dogs gain CHIC certification by completing their health testing, regardless of their test results. **CHIC is about health consciousness, not health perfection.** As more tests for defective genes are developed, every individual is likely to carry some deleterious genes.

Veterinarians should ask for pedigrees and results of parental or early age health testing of pure-bred and cross-bred puppies and kittens on first presentation to their clinics. If the test results were not provided to the owner, many can be immediately searched in on-line databases like OFA or CHIC. **A lack of available test results shows that the puppy or kitten was not purchased from a health conscious breeder, and it may be liable to develop genetic disease.** The general public must be educated to become informed “consumers” when purchasing puppies and kittens. They should spend as much time researching the purchase of what will become a member of their family for 10+ years, as they do purchasing home appliances. Breeder health guarantees that provide for replacement of puppies and kittens with genetic disease are often worthless; as few pet owners will be

willing to give up a member of their family once an emotional bond has been established.

Example: Cerebellar Abiotrophy (Ataxia) in Scottish Terriers

The Scottish Terrier Club of America (STCA) has provided all of the tools necessary to determine genetic risk of carrying the defective gene causing the autosomal recessive genetic disorder cerebellar abiotrophy (CA), or for producing affected puppies. CA is a degenerative neurological disease that causes slowly progressive incoordination from several months to several years of age. The defective gene is old, and widespread in the Scottish Terrier gene pool worldwide.

The STCA has an area on their website entitled CA Central (www.stca.biz/GrandCentral/) where a list of all confirmed CA affected dogs and their pedigrees is listed. The club maintains an on-line searchable pedigree database (www.stca.biz/pedigrees/) that includes identification of all dogs with obligate CA risk. They also have a relative risk analysis calculator in CA Central that allows breeders to calculate the CA carrier and affected risk of dogs and of proposed matings.

The STCA has funded several studies to identify the autosomal recessive defective gene causing CA, and its members and breeders hope to some day have a genetic test for carriers. However, CA Central allows their breeders to minimize their current risk of producing Scottish Terriers affected with cerebellar abiotrophy, and reduce the frequency of the defective gene now, while waiting for a genetic test to be developed.

Health testing, and the knowledgeable use of test results is now an important requirement

for responsible breeding. Breeders, veterinarians, and breed organizations must educate the general public of the need to check for health testing in their dog and cat purchases. As this happens, the overall genetic health of purposely-bred dogs and cats will improve.

(This article was originally presented at the 2007 Tufts' Canine and Feline Breeding & Genetics Conference. This article can be reproduced with the permission of the author.)

Clinical Trial For Atopic Dogs

Dr. Rosanna Marsella of the University of Florida Veterinary School in Gainesville, Florida is conducting a study of atopic dogs. If you are interested in participating in this clinical trial or have questions, please contact Dr. Marsella at 352-278-0742.

Dr. Marsella is requesting dogs, possibly not too severe and clear of secondary infections. The study provides the test product and includes cytologies and visits. The study is 4 weeks long and rechecks will be done every 2 weeks. Clients will have to apply a topical product three times a week. Clinical signs and transepidermal water loss will be evaluated. The test is non-invasive and simply involves placement of a probe on the skin for a few seconds to read the amount of water that is evaporated. Antibiotics, antifungals or cultures that may be needed before enrolling in the study are not covered. The value of the visits and cytologies received is \$500.

The trial will include three visits, two weeks apart and no overnight stays are necessary. The study is open to all breeds.



Collecting And Utilizing Phenotypic Data To Minimize Disease: A Breeder's Practical Guide

By Rhonda Hovan

reprinted from the Orthopedic Foundation for Animals (OFA) website, www.offa.org

Since its inception in 1966, the Orthopedic Foundation for Animals (OFA) has been providing information intended to help breeders reduce the incidence of genetic disease in dogs. Most breeders have found this service to be very helpful, and have seen important improvements in the health of their dogs through the diligent use of OFA data.

Yet there remains a widespread lack of understanding regarding the optimal use of phenotypic information in breeding programs. As a result, many breeders have not taken full advantage of the information available, slowing their progress toward minimizing disease. The methods of collecting and analyzing phenotypic data presented here offer breeders the opportunity to dramatically decrease the incidence of genetic disease in their breeding programs to a level often significantly below that reported as a breed average by OFA and other statistical databases.

A Comparison of Genotypic Tests to Phenotypic Tests

In recent years, DNA tests for numerous canine diseases have been developed, and this progress is expected to continue. Where available, such tests offer breeders direct information about the genes that an individual tested dog can contribute to his or her offspring. DNA tests are an example of genotypic tests, and are the gold standard as tests for disease causing genes. Breeders can be confident that DNA tests will provide them with very accurate information, leaving little room for an unexpected appearance of the gene in offspring.

However, DNA tests are not available for the majority of common canine diseases. Most tests intended to offer breeders health information about a dog's suitability for breeding, rely instead on an evaluation of the dog's physical status at the time of examination. These are called phenotypic tests, and include evaluations for hip and elbow dysplasia, many eye and cardiac diseases, patella and thyroid disease, and most current canine disease evaluations.

Fortunately for the dogs – but unfortunately for breeders attempting to reduce the incidence of disease – many harmful genes do not manifest as detectable disease during the prime breeding age of the dog, if ever. These dogs may appear normal, yet carry genes capable of causing disease. A number of types of gene actions can contribute to this confusion, for example: recessive genes, incomplete penetrance of the gene, variable expressivity of the gene, multiple genes involved in the disease, and even environmental influence on expression of the trait. Further, diseases that have a late age of onset such as certain eye and cardiac abnormalities, can result in normal phenotypes for a period of time, even when the disease gene is present.

full siblings are, on average, equally genetically similar to each other as they are to each of their parents.

In an attempt to compensate for these inherent flaws with common phenotypic tests, many breeders have long realized the importance of gathering test information on more than just the prospective sire and dam of a litter. Because standard pedigrees include only direct ancestors such as parents, grandparents, great-grandparents and so on, these are the relatives on which breeders usually focus when seeking additional health information. It is not uncommon for conscientious breeders to build pedigrees which are described as “three generations clear” for a disease, meaning that the sire and dam, the 4 grandparents, and the 8 great-grandparents have all tested phenotypically normal. Yet such breedings may produce less than satisfying results, as the disease genes may still be present, and affected offspring may still be produced.

Fortunately, there is an additional way of utilizing phenotypic test data which improves the likelihood of producing predictable results. It involves a different method of building pedigrees.

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Vertical Pedigrees

Traditional pedigrees expand horizontally; that is, they are read from left to right with relatively few dogs appearing at the far left and increasing to the predominant number of ancestors listed to the right. Although the dogs to the left (the sire, dam, and grandparents) most directly impact the resulting offspring, there are only six of these contributing data on this type of pedigree. That is a small sampling of the relevant information that may actually be available. While many additional dogs are named on the right side of the page, these more distantly related dogs are less significant genetically than are those on the left.

A pedigree can also be constructed vertically, most easily using a three column format. A vertical pedigree of "Dog A" begins page left with Dog A and all of his full siblings (from one or more litters). The central column lists his sire and dam, and their full siblings; with the right column doing the same with the four grandparents. Clearly, vertical pedigrees can include many more first and second generation relatives than do traditional horizontal pedigrees.

The value of vertical pedigrees can be most fully appreciated through understanding an essential genetic principle that should correctly be the foundation of most complex breeding decisions. This principle is that full siblings are, on average, equally genetically similar to each other as they are to each of their parents. All



of the littermates taken as a group represent various combinations of their parents' genes, and are good indicators of the range of possibilities that are likely to be passed on from any one of them. Likewise, phenotypic information about the aunts and uncles of a given dog, is equally as important as is that of the grandparents. Thus, dogs who do not even appear on traditional horizontal pedigrees, may be more significant genetically than are the more distant relatives who do. By overlooking these siblings, aunts, uncles, great-aunts, and great-uncles, the pertinent data base may be reduced by as much as four fold or more (the number of littermates for whom data might be available).

The broad data base that is accessible using vertical pedigree analysis gives breeders accurate information about any trait that cannot be tracked in a direct manner. Whenever multiple genes and/or other complex modes of inheritance are involved, a larger sampling will be more likely to contain enough individuals to indicate a pattern. Accuracy then, is dependent upon accumulating phenotypic information on as many of these direct and indirect relatives as possible.

A simple example should help illustrate how this works. Suppose that a breeder would like to compare two potential stud dogs, "A" and "B," with regard to their likelihood of producing normal hips. Written in standard horizontal form, their pedigrees with OFA hip status noted* are as follows:

OFA Fair is in italic type; OFA Good is in upper/lowercase type; OFA Excellent is in Uppercase type; Dysplastic dogs are in bracketed type.

Paternal Gr-Sire "Fair"	Paternal Gr-Sire "Fair"
Sire "Good"	Sire "Good"
Paternal Gr-Dam "Good"	Paternal Gr-Dam "Good"
Stud Dog A "Fair"	Stud Dog B "Good"
Maternal Gr-Sire "Good"	Maternal Gr-Sire "Good"
Dam "Good"	Dam "Good"
Maternal Gr-Dam "Good"	Maternal Gr-Dam "Good"

On the surface, both of these pedigrees appear to be making progress toward reducing the incidence of hip dysplasia. All other factors being equal, the investigating breeder might be persuaded by his more favorable hip rating to choose Stud Dog B. Imagine the frustration, then, if several of the resulting pups develop hip dysplasia.

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Now expand the two pedigrees vertically, and compare the data that is available in this format:

1st Generation	2nd Generation (Parents, Aunts, Uncles)	3rd Generation (Gr-parents, Gr-Aunts, Gr-Uncles)
Stud Dog A “Fair” Sibs (7): Fair Fair Good Good Good EXCELLENT	Sire “Good” Sibs (8): Fair Fair Good Good	Paternal Grandsire “Fair” Sibs (6): Good Good <hr/> Paternal Granddam “Good” Sibs (8): Good {dysplastic}
	Dam “Good” Sibs (10): Fair Fair Fair Good EXCELLENT {dysplastic}	Maternal Grandsire “Good” Sibs (?) <hr/> Maternal Granddam “Good” Sibs (9): Good
Stud Dog B “Good” Sibs (9): Fair Fair Good {dysplastic} {dysplastic} {dysplastic} {dysplastic}	Sire “Good” Sibs (7): Fair Good Good Good {dysplastic}	Paternal Grandsire “Fair” Sibs (7): Fair Fair Good Good <hr/> Paternal Granddam “Good” Sibs (?) <hr/> Maternal Grandsire “Good” Sibs (10) Fair {dysplastic} {dysplastic} {dysplastic}
	Dam “Good” Sibs (6): Fair Fair {dysplastic} {dysplastic}	Maternal Granddam “Good” Sibs (6): Fair Good EXCELLENT

An evaluation of the vertical pedigree reveals that Stud Dog A comes from a litter with predominantly normal hips, and this is consistent also with his sire, dam, and their siblings. Thus, the range of possibilities in his genetic package heavily favors normal hips.

In contrast, Stud Dog B dog comes from a litter in which half of the dogs are normal, and the other half are dysplastic (with one unknown). Furthermore, this is a pattern which can be traced back through his dam and maternal grandsire. Thus, despite his own “good” rating, Stud Dog B’s range of possibilities may include a higher likelihood of transmitting hip dysplasia. This pedigree is not demonstrating progress toward reducing the incidence of affected dogs.

Additional Factors to Consider In Evaluating Vertical Pedigrees

Of course, not all vertical pedigrees will be as clear-cut as in the previous example. Further, diseases other than hip dysplasia may require a different process of analysis. Two of the most important variables to examine are:

- 1) the frequency of the disease in the vertical pedigree as compared to the frequency of the disease in the breed population, and
- 2) the location of the affected individuals on the pedigree.

Frequency of the disease in the vertical pedigree as compared to the frequency of the disease in the breed population

Because of the larger number of individuals represented on vertical pedigrees, sometimes very few pedigrees will appear completely free of affected dogs, as might

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(Phenotypic continued from page 8)

be found using the traditional format. As illustrated with the example of Stud Dog A, even respectable and desirable pedigrees often contain an occasional affected dog. Therefore, a realistic goal for breeders is to use those pedigrees which demonstrate a significantly lower rate of disease as compared to the general breed population.

Since the incidence of any given disease varies from one disease to another, and from one breed to another, such factors should be taken into consideration when evaluating pedigrees. For example, with less common diseases, using completely disease-free vertical pedigrees may be the only way to maintain a low rate of disease in the breed. Diseases with a moderate or high breed frequency are most effectively managed by selecting individuals whose vertical pedigrees contain a large amount of data, and few affected dogs.

The location of the affected individuals on the pedigree

Of course, in addition to how many affected dogs appear on a vertical pedigree, their location on the page must also be taken into consideration. Clearly, dogs appearing farther to the left on the page have a more direct genetic impact than do those appearing toward the right. Further, multiple affected dogs within a single location may be an important factor. Thus, Stud Dog A's pedigree, with 2 dysplastic relatives scattered among 28 total dogs, would generally be considered to be a strongly normal pedigree. Yet even if nothing else were known about Stud Dog B except that he has 4 dysplastic siblings, this pedigree should be excluded from most breeding programs. With four affected dogs focused in the column farthest to the left, this pedigree has disease genes concentrated in a very influential position.

Collecting Data for Vertical Pedigrees

In many breeds and for many diseases, it is recognized that the availability of vertical pedigree data currently may be limited. This is partially due to the historical lack of understanding of the importance of such information. Now, through its commitment to breeder education, OFA hopes to stimulate a new and steady improvement in results, using this method of building and analyzing vertical pedigrees. If breed clubs also begin to emphasize the value of such pedigrees to their membership, it is reasonable to anticipate much wider availability of this data in the near future.



However, all breeders are encouraged not to wait for future change within their breed, but rather to create that change within their own breeding programs. Significant improvements are possible even in a relatively brief period of time, using very achievable methods of collecting data.

Building A Personal Data Base

Both long term breeders, and new hobbyists, can build a useable data base in as little as one or two generations. The most immediate information can be collected retrospectively by seeking examination results on the siblings of dogs currently being considered for breeding. Where available, results on those dogs' aunts and uncles can also be gathered. While such data may be spotty, it is worth making the effort to contact owners and breeders of those siblings, aunts, and uncles. OFA's online database is also searchable by siblings, and may provide some additional information.

Perhaps more effective, however, is to begin building a data base of all future puppies that a breeding program produces. There are two very effective strategies which can be used in combination to facilitate this process.

Strategy 1

Beginning prior to the sale of a puppy, the breeder typically discusses with prospective buyers, health examinations that have been performed on the sire, dam, and other relatives. This is the ideal time to explain to the buyer that his new puppy will also have valuable information to contribute to the next generation of the breeding program. Just as the current buyer appreciates and trusts a breeder who is conscientious about health issues, so the buyer will understand that he has a role

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in helping the breeder make good decisions about future litters. The breeder should explain clearly what examinations are expected, at what ages these are performed, typical costs, and other factors such as convenience (local health screening clinics if available; or if any traveling may be required).

In breeds for which there are numerous, expensive, or very inconvenient genetic screening tests, breeders may need to compromise to keep those burdens at a level which would be acceptable to most reasonable buyers. In such cases, the breeder may choose to focus efforts toward the most common or most debilitating diseases in the breed, or those which have the greatest impact on the individual breeding program. Because of practical considerations, it may be necessary to request only certain specific health screening examinations; and have the flexibility to forego results on diseases of lower priority.

Nonetheless, while agreeable at the time of sale, some buyers are still reluctant to follow through when the time comes. These buyers can often be coaxed to participate by offers of assistance, such as the breeder taking the dog for the exam, or the breeder offering to groom the dog prior to the examination.

For greater assurance of compliance, many breeders find it effective to take a refundable deposit at the time of sale. This may be set approximately equal to or slightly higher than the costs of the health examinations, so that the buyer has incentive to complete the testing. It is also helpful to include the request for health screening examinations in the written sales contract or guarantee.

Strategy 2

The factors which take the greatest toll on buyer compliance are elapsed time, and lack of contact with the breeder. In diseases such as hip dysplasia, for which final OFA clearances are not available until the dog is two years old, it may have been 18 months or more since the breeder last spoke with the owner of the puppy. Especially if all is going well with the pup, the buyer may no longer

be as concerned with health issues as he was prior to the purchase. Further, buyers are more reluctant to leave a refundable deposit when the term of the deposit extends out nearly two years.



A number of other factors also contribute to the concept that obtaining early preliminary hip x-rays is a nearly ideal plan for breeding programs.

To overcome all of those issues, breeders are encouraged to take advantage of early preliminary examinations in diseases for which preliminary evaluations have a high percentage of accuracy. For example, OFA preliminary hip evaluations done on dogs at 3 to 6 months of age, have an overall reliability of 89.6% for dogs graded as normal, and 80.4% for dogs graded as dysplastic.¹ That is, nearly 90% of dogs graded normal at 3-6 months of age on OFA preliminary evaluations, remained normal at 2 year final evaluations; and about 80% of those diagnosed as dysplastic between 3-6 months of age, remained dysplastic as adults. These percentages are even higher for dogs who were graded as "Good" or "Excellent", and "Moderate" or "Severe." Most of the dogs whose 2 year evaluations differed between normal and abnormal as compared to their 3-6 month evaluations, were those who were graded "Fair," "Mild," or "Borderline" on their preliminary report. The status of such dogs can be determined with greater accuracy with increasing age, and when possible, even non-breeding dogs in those categories should be resubmitted as adults.

This high degree of reliability means that OFA preliminary hip evaluations can have great value for breeders constructing vertical pedigrees. Because of the probability that most of the puppies a breeder produces will never have final hip x-rays submitted for certification, the possibility of obtaining much of that otherwise lost data on preliminary examination is very attractive.

A number of other factors also contribute to the concept that obtaining early preliminary hip x-rays is a nearly ideal plan for breeding programs. First, current vaccine protocol recommends the last puppy vaccination at approximately 3-1/2 to 4 months of age. Since presumably all pups will be going to the veterinarian for this vaccination, it is usually a very convenient time to schedule the preliminary hip x-ray. Further, most pups of this age do not need

(Continued on page 11)



(Phenotypic continued from page 10)

sedation or anesthetic to obtain good positioning, thereby reducing cost and perceived risk to the dog. This time frame is also well within the period that the breeder usually has the most contact and influence with the buyer. All of these considerations combine to produce excellent compliance, and thus build a much larger data base than most breeders are able to obtain with 2 year hip evaluations. This greatly increased volume of data more than compensates for the slightly decreased rate of accuracy of preliminary OFA hip evaluations.

Breeders using this recommended early preliminary method of data collection may also choose to follow certain other associated procedures. The breeder may request that each puppy owner send the x-rays to the breeder, rather than directly to OFA. This provides the breeder with the opportunity to evaluate the films for correct positioning; and the breeder can then take advantage of OFA's reduced price for preliminary hip evaluations of littermates submitted together. OFA's preliminary evaluation service provides the important advantages of known accuracy and consistency of preliminary evaluations; and of a written report that is widely accepted among breeders nationwide. Please note, however, that even when littermates' x-rays are submitted together, the OFA reports will be released only to the owners or co-owners as represented on the accompanying information cards.

An additional and highly useful advantage for breeders obtaining early preliminary data, is that the information gathered from a relatively recent litter may be taken into consideration as part of the decision making process prior to breeding subsequent litters with the same or similar parentage. Particularly in the case of a bitch, genetic information about her offspring that is not available until they are two years of age, sometimes comes too late in her breeding career to influence decisions appropriately. Preliminary genetic screening permits breeders to use the information in a much more timely manner, amplifying its immediate value to the breeding program.

Beyond Disease

As breeders become familiar with evaluating dogs or potential breedings using vertical pedigrees, they will find that its principles can be applied equally well to many genetic characteristics other than disease. Any trait for which there is a complex mode of inheritance can be examined more successfully using vertical pedigrees, than using the traditional horizontal format. And in fact, most conformation and performance characteristics are ideal candidates for vertical pedigree analysis, because

achieving correct balance, breed type, movement, and desired temperament clearly is an extremely complicated task!

Vertical pedigrees can assist breeders in identifying "families" that have a strong likelihood of producing highly desirable characteristics, or those families in which less desirable traits may predominate. Careful examination of vertical pedigree data can help breeders avoid one of the most common mistakes of many breeding programs. This is that breeders frequently select an individual dog who manifests excellence in certain characteristics, and bring that dog into a breeding program hoping to add or strengthen those characteristics in their lines. Although they may have given consideration to that dog's sire and dam, they often overlook the fact that the desired traits are weak or absent in the littermates. Unfortunately, a single "star" littermate is likely to produce exactly that: litters that may contain a promising individual, but among more ordinary, possibly disappointing siblings.

Consistent, predictable qualities are typically produced only when vertical pedigrees demonstrate those qualities consistently.

Consistent, predictable qualities are typically produced only when vertical pedigrees demonstrate those qualities consistently. In the majority of cases, dogs who are known as "prepotent" are those dogs whose vertical pedigrees show strong evidence of this consistency. Therefore, high quality dogs whose siblings and aunts and uncles are of similar high quality and desirability, are the dogs who will contribute that quality and desirability most reliably to their own offspring. Contrary to some common beliefs, it is not necessary for a dog to be line-bred to be prepotent, providing there is strong consistency within its first and second generation vertical pedigree. Using vertical pedigree data to achieve consistency without linebreeding also provides breeders with the opportunity to maintain a richer and more vigorous gene pool within their breeding program.

A Dependable Breeding Philosophy

The concepts advocated herein are based on sound genetic principles, and are designed to help breeders manage many types of complicated real world breeding decisions. The OFA recognizes that most hobby and competition breeders have admirable intentions, but are faced with

(Continued on page 12)



(Phenotypic continued from page 12)

a challenging blend of art and science in which one of the most frustrating aspects is the seeming unpredictability of results. Vertical pedigree construction and analysis is a very powerful tool which can assist in reducing surprises and improving predictability. With this method, progress toward one's goals is usually more assured, and the risks of unexpected and potentially devastating disease is decreased. This technique can help breeders build a foundation which can become stronger and more dependable with every successive generation. By working closely together, OFA and the conscientious breeders who depend on its services, can continue to make significant strides toward protecting and advancing the health of dogs.

Rhonda Hovan is a breeder, exhibitor, and judge of Golden Retrievers, and serves on the Board of Directors of the OFA. As a canine health and genetics writer, she has won the Veterinary Information Network Health Education Award.

¹ Corley EA, Keller GC, Lattimer JC, et al. Reliability of early radiographic evaluations for canine hip dysplasia obtained from the standard ventrodorsal radiographic projection. J Am Vet Med Assoc 1997; Vol 211, No. 9; 1142-1146.

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Grant Progress Report Review

Grant: 01312: Association mapping study of Legg-Calve-Perthes Disease in the West Highland White Terrier, Yorkshire Terrier, and Cairn Terriers

Principal Investigator: Dr. Keith E. Murphy, PhD

Research Institution: Clemson University

Grant Amount: \$78,688.00

Start Date: 1/1/2010 **End Date:** 12/31/2011

Progress Report: 12 month

Report Due: 12/31/2010 **Report Received:** 1/18/2011

Recommended for Approval: Approved

(Content of this report is not confidential. A grant sponsor's CHF Health Liaison may request the confidential scientific report submitted by the investigator by contacting the CHF office. The below Report to Grant Sponsors from Investigator can be used in communications with your club members.)

Original Project Description:

Background: Legg-Calve-Perthes Disease (LCPD) is a debilitating developmental disease that affects small breeds of dog, particularly terrier breeds. The only outward indications of this condition are pain, lameness, and muscle atrophy of the hip joint. These signs are not exclusive to LCPD, and are often attributed to minor trauma during the early stages of disease. LCPD is primarily diagnosed by radiographic changes of the femoral head within the hip joint. Due to the developmental nature and the unknown etiology of the disease, LCPD is difficult to predict and prevent. No disease mapping strategies have been employed to date.

Objective: This study is using the Affymetrix canine single nucleotide polymorphism (SNP) chip to identify regions that are linked to LCPD in the West Highland White Terrier, Yorkshire Terrier, and Miniature Pinscher breeds.

Grant Objectives:

Objective 1: Sample collection and phenotype confirmation. Collect a total of 200 samples with a minimum of 50 per breed.

Objective 2: Probe SNP array for genome wide association

Publications:

Report to Grant Sponsor from Investigator:

This study aims to dissect the genetic component(s) of Legg-Calve-Perthes Disease (LCPD) in terrier breeds through genomic analyses. Previous studies have suggested LCPD is transmitted in an autosomal recessive pattern. Our current data suggest the LCPD is inherited in either a dominant or complex fashion. Only with more samples will we begin to understand the genetics controlling LCPD. One candidate gene identified in humans was investigated in canine LCPD, but was not associated with LCPD in West Highland White Terriers.

Interested owners willing to participate in the study are referred to submission instructions found at www.clemson.edu/cgr. Questions regarding this study should be directed to Dr. Alison Starr (astarr@clemson.edu).



Grant Progress Report Review

Grant: 00945: Mucosal Gene Expression Profiles in Canine Inflammatory Bowel Disease

Principal Investigator: Dr. Albert E. Jergens, DVM, PhD

Research Institution: Iowa State University

Grant Amount: \$60,000.00

Start Date: 6/1/2008 **End Date:** 12/31/2011

Progress Report: 30 month

Report Due: 11/30/2010 **Report Received:** 11/22/2010

Recommended for Approval: Approved

(Content of this report is not confidential. A grant sponsor's CHF Health Liaison may request the confidential scientific report submitted by the investigator by contacting the CHF office. The below Report to Grant Sponsors from Investigator can be used in communications with your club members.)

Original Project Description:

Background: Canine inflammatory bowel disease (IBD) is a chronic intestinal disorder likely resulting from the interaction between genes and environmental factors. While it is generally accepted that luminal bacteria play a critical role in provoking gut inflammation, genetic factors may also contribute to the bacterial-driven inflammatory response. Several susceptibility genes, such as NOD2/CARD15, have recently been identified in humans with IBD and provide a basis for the development of aberrant immune responses to bacteria in certain individuals. It is reasonable to hypothesize that susceptibility genes also affect clinical disease in dogs with IBD by negatively affecting the interaction with intestinal bacteria and/or their products. Genetic factors are thought to contribute to the pathogenesis of canine IBD as in humans. A role for luminal bacteria is suggested by observations that antibiotics reduce clinical signs, and by reports of increased bacterial numbers in intestinal biopsy specimens obtained from dogs with IBD. Given the recognized breed predispositions, genetic susceptibility to IBD is also likely, although studies are lacking.

Objective: The researchers are utilizing unique molecular biology tools to: (1) identify key genetic factors contributing to disease expression, (2) characterize gene expression profiles which may predict responsiveness to specific therapies, and (3) provide the framework upon which to facilitate identification of IBD susceptibility genes that predispose specific canine breeds to clinical disease.

Grant Objectives:

Hypothesis: Gene expression profiles in intestinal tissue samples of dogs with IBD will provide comprehensive insight into altered gene expression patterns contributing to gut inflammation.

Objective 1: To investigate global gene expression patterns of inflamed intestinal tissues and normal control intestinal tissue using RNA microarrays. The differentially expressed transcripts will identify patterns associated with inflammation and host immune responses.

Objective 2: To utilize quantitative RT-PCR to confirm microarray data and validate unique gene expression signatures in dogs with IBD.

Objective 3: Evaluate the clinical, microbiologic, and anti-inflammatory effects of FOS administration in dogs with IBD. (Appended Objective)



Publications:

- Suchodolski, Js, Xenoulis, Pg, Paddock, Cg, Steiner, Jm and Jergens, Ae (2010) Molecular analysis of the bacterial microbiota in duodenal biopsies from dogs with idiopathic inflammatory bowel disease. *Veterinary Microbiology*. 142, 394-400. <http://www.sciencedirect.com/science/article/B6TD6-4XNF6FB-1/2/0563bf86e9fc8c4da7851cf9654ac8dd>

Report to Grant Sponsor from Investigator:

Canine inflammatory bowel disease (IBD) is a chronic intestinal disorder likely resulting from the interaction between genes and environmental factors. We propose to utilize unique molecular biology tools to: (1) identify key genetic factors contributing to disease expression, (2) characterize gene expression profiles which may predict responsiveness to specific therapies, and (3) provide the framework upon which to facilitate identification of IBD susceptibility genes that predispose specific canine breeds to clinical disease. We are making good progress towards these goals as evidenced by the following:

(Continued on page 14)

(Mucosal Gene Grant continued from page 13)

We have collected samples from a representative heterogeneous population of 18 IBD dogs for comparison to 6 healthy dog tissues.

We have carefully extracted the genetic material (RNA) from endoscopic samples which will be used in our gene profiling studies.

We have now evaluated gene expression profiles in the normal versus diseased dog groups using sophisticated statistical modeling to help us 'tease out' gene expression patterns which discern healthy versus diseased intestinal tissues. It is our expectation to identify specific genes which serve as biomarkers for diagnosing canine IBD and for monitoring the effects of therapy. We have now identified a grouping of 17 'marker' genes that may be more critically assessed in future studies.

We have noted that IBD dogs show differences in intestinal gene expression as compared to healthy dogs; and these differences in expression may help to explain the mechanisms of chronic inflammation in affected dogs.

We have preliminary evidence that changes in the intestinal bacteria accompany the abnormal gene patterns. It is our belief that this association should be explored more fully with additional studies; since this situation is identical to the association between people and their intestinal bacterial populations causing human IBD (i.e., Crohn's disease and ulcerative colitis).

We have now confirmed the expression patterns of select differentially expressed genes in diseased dogs using sophisticated molecular techniques. This suggests that the observations regarding gene expression patterns using the gene chips are accurate.

Morrison Animal Foundation Progress Report

D08CA-002:

Canine Atopic Dermatitis-Relation to Epidermal Anti-Microbial Gene Expression,
Mark S. Rutherford, PhD

Results: Altered Gene Expression May Worsen Dogs' Skin Allergies

Atopic dermatitis, skin inflammation caused by environmental allergens, affects many dogs, many of whom develop secondary skin infections that aggravate suffering and require antibiotic treatment. The skin's immune system contains small antimicrobial peptides (proteins) that defend the skin against infections. Humans with atopic dermatitis and secondary bacterial infections are deficient in certain antimicrobial peptides, so scientists are now investigating whether allergic dogs also lack these peptides.

Researchers extracted RNA from samples and then applied standardized assays to measure and compare defensin gene expression. Defensins are small blood and tissue peptides that help prevent and clear infections. They also measured gene expression from various skin regions and discovered significant variation in expression depending on the body location of these skin samples. Researchers learned that atopic dogs showed altered expression of several antimicrobial genes, though in unpredictable ways. The data are encouraging in that the pattern of gene expression may predict dogs at risk for secondary skin infections during atopic dermatitis; however, further study is needed to control for breed, gender and age effects on expression of these genes.

Thank You Regional Club Liaisons!

Thank you regional club liaisons for helping to establish an effective, two-way communication between the Regional Clubs of WHWTCA and the Westie Foundation. Without your help we would not be able to reach out to your many club members and inform them of the important initiatives of the WFA that strive to improve the health and wellbeing of our Westies. You are providing a valuable service on behalf of your club and the Westie Foundation. We appreciate your support and welcome your feedback as to how we can better serve your club.

Sincerely,
Ann Marie Holowathy
Chair, WFA Liaison Committee

WHWTCA Regional Club Liaisons:

California – Kim Smith
Chesapeake Bay – Ann Piesen
Connecticut – Lee Trudeau
Florida Suncoast – Claudia Garone
Greater Atlanta – Angela Jennings
Greater Denver – Mary McArthur
Greater New York – Ida Keushgenian/
Karen Nothmann
Greater Washington – Karen Spalding
Indiana – Cheryl Stinson
New England – Carol Boughrum
Northern Illinois – Pam Grove
Northern New Jersey – Nick Vanick
Northern Ohio – Betty Miller
Puget Sound – Ella Selfridge-Neumann
San Francisco Bay – Gail Krieger
SE Michigan – Janice Collins
SE Texas – Paula Christie Cohen
Trinity Valley – Olivia Nesler
Valley of the Sun – Helen Bixenman
Western PA – Phyllis Vogt
Westie Club of the South - BJ Harrison
William Penn – Ann Marie Holowathy



Visit Our Website

www.westiefoundation.org



It's time to take a look at some of our new web features:

- A wonderful presentation entitled, *Skin Dysfunction in the West Highland White Terrier* by Dr. Rosanna Marsella, DVM DACVD, was presented at our

national Roving Specialty and is now available in PowerPoint on the website.

- Information on the Canine Health Information Center (CHIC), and the health clearances recommended for Westies are listed. Please take time to review the procedures for obtaining these very important health clearances.
- Under the Westie Health drop down menu, a new section has been added to include European Westie Health Surveys .
- Look for the latest progress reports on grants and proposals partially funded by the Foundation also under the Westie Health drop down menu.
- Check us out on Facebook! Try using the header buttons on the home page to quickly link to important Westie information.

The website committee is always interested in new Westie information which would be appropriate for our site. Please feel free to send suggestions to the address listed below.

Donna Hegstrom
Website Chairperson
Kiloranleawesties@gmail.com



FREE EDUCATIONAL SEMINAR

Inherited Eye Disease in Westies

András M. Komáromy, DrMedVet, PhD

Thursday, October 6, 2011

6:30 PM

Flash! New Location!

Comfort Suites

700 West Uwchlan Ave, Exton, PA 19341

(across from the Hampton Inn on the SW corner of Rt 100 and Rt 113)

The presentation will cover eye diseases/abnormalities that are known or suspected to be inherited in the West Highland White Terrier. Strategies will be discussed to address inherited eye diseases in dogs including eye certification (CERF exams) and DNA testing. There will be sufficient time to answer questions from the audience and to talk about some of the basics of dog vision.

Join us for this informative seminar which is free of charge. Please note that there will be no dinner available at the seminar. Come early so you can shop at our sales table featuring unique Westie items.

***Dr. Komaromy will be conducting a CERF clinic at Kimberton on Saturday, October 8th. To register, contact Nancy Stolsmark at livlafluv2000@aol.com.**

For more information about the seminar contact
Ann Marie Holowathy
aholowathy@msn.com
215-345-6333

For biographical information about our speaker visit
www.westiefoundation.org



CHIC and Westies

By Ann Marie Holowathy

CHIC, the Canine Health Information Center, is a centralized canine health database jointly sponsored by the AKC/Canine Health Foundation and the Orthopedic Foundation for Animals (OFA). CHIC is endorsed by the West Highland White Terrier of America and the Westie Foundation of America.

A CHIC number and report is issued once a dog's breed specific test results are entered into the database. Owner approval is required for results to be published. However, CHIC encourages sharing all results, whether normal or abnormal. **All dogs must have permanent identification (microchip or tattoo) for entry into the database.**

The breed specific requirements for West Highland White Terriers include the results of three screenings:

- 1. Hip X-ray:** A hip X-ray is used to determine the absence or presence of hip dysplasia and Legg-Calvé-Perthes. The hip X-ray can be done at your vet's office or at an OFA Clinic sponsored by a kennel club. Dogs should be at least two years of age before screened and short acting anesthesia is recommended to insure accuracy of the X-ray. Bitches immediately coming into or going out of season should not submit hip X-rays since hormonal influences could alter results. Waiting at least 2 months after a bitch comes out of season is recommended. The vet who performs the X-ray fills out an official OFA form and sends the digital X-rays with an accompanying fee to the OFA.

**Results from the OFA database indicate that 12% of westies have abnormal ratings for hips.*

- 2. Patellar Screening:** Your vet can evaluate the patellas of your dog and determine if there is any evidence of luxation. This does not require an X-ray. Dogs should be at least one year of age before being evaluated. The vet fills out an official OFA form and the owner submits the form with accompanying fee to the OFA.

- 3. CERF (Canine Eye Registration Foundation) Exam:** This exam is used to diagnose eye diseases and must be done by a certified ophthalmologist who has the necessary forms that need to be submitted to CERF along with an accompanying fee. It is recommended that CERF exams be done yearly. The dog's eyes need to be dilated twenty minutes before the exam. The effects of the dilation subside within two hours and during this time period the dog should not be exposed to bright sunlight.

**At the CERF clinic held during the Centennial week, 10.8-17 % of the 66 Westies tested were identified with eye abnormalities.*



Forms Required: Application forms must be submitted for entry into the hip and patella database. The forms can be downloaded from the OFA website at www.offa.org and should be given to your vet when you have scheduled a hip X-ray or patellar screening. A board-certified ophthalmologist will provide the necessary CERF form upon completion of an eye exam.

CHIC has an excellent website located at www.caninehealthinfo.org. The website contains basic information about CHIC, such as its mission and goals, and maintains a listing of breeds and approved breed specific test protocols. There is also a section entitled "Frequently Asked Questions" that is very helpful. **More importantly, the web site has links to the actual databases so you can see the test results from all the westies in the database.**

Owners, breeders, and researchers benefit as CHIC is a reliable source of data which can be used to assist in breeding healthy dogs. As more tests become available and results entered, the CHIC database can help determine whether the progeny from a particular breeding will be affected by an inherited disease or condition. As time goes on you will be hearing more and more about CHIC and the benefits of its database. Having our Westies tested and submitting those results to the CHIC database is one way we can truly be caretakers of the breed we love.



Terrier Breeds and CHIC

There are 166 breeds registered with the Canine Health Information Center (CHIC). The parent club of each breed determines which health clearances are necessary to meet the requirements for a CHIC number for that breed. Nineteen terrier breeds are registered with CHIC. The chart below lists the required tests for each terrier breed and those tests that are optional (*).

Based on the recommendation of its health committee, the WHWTCA chose three screening tests needed for a Westie to receive a CHIC number. Test results do not have to be

normal to receive a CHIC number; all that is required is to submit the results of the screening test to CHIC. Also note that CHIC allows the breeder the option to withhold any abnormal test results from being published. However, for the benefit of the breed, the health committee of the WHWTCA and the Westie Foundation of America strongly recommend that all results are released, normal or abnormal.

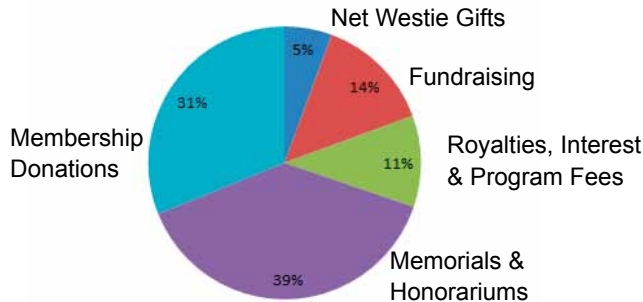
For more information about CHIC visit their website at www.caninehealthinfo.org.

Airedale	Elbows*		Hips	Eyes*	Thyroid*	Cardiac	Renal	
American Hairless Terrier	Elbows*	Patellas	Hips(LCP)	Eyes*		Cardiac		Deafness*
American Staffordshire	Elbows*		Hips	Eyes*	Thyroid	Cardiac		Cerebellar Ataxia
Australian Terrier		Patellas		Eyes	Thyroid			
Bedlington		Patellas		Eyes				Copper Toxicosis
Border Terrier		Patellas	Hips	Eyes		Cardiac		
Bull Terrier		Patellas				Cardiac	Kidney	Deafness
Glen of Imaal			Hips	Eyes				Cone Rod Dystrophy
Kerry Blue Terrier			Hips	Eyes				Factor XI*, von Willebrand's* Degenerative Myelopathy*
Miniature Bull Terrier				Eyes		Cardiac	Kidney	Deafness
Miniature Schnauzer				Eyes		Cardiac		Myotonia Congenita*
Norfolk Terrier		Patellas	Hips*	Eyes		Cardiac		Icthyosis*
Norwich Terrier		Patellas	Hips	Eyes				
Parson Russell Terrier		Patellas		Eyes				Deafness
Russell Terrier		Patellas		Eyes				Deafness
Scottish Terrier		Patellas		Eyes*	Thyroid*			Von Willebrand's
Sealyham Terrier				Eyes				Primary Lens Luxation
Soft-Coated Wheaten Terrier			Hips	Eyes				
West Highland White Terrier		Patellas	Hips	Eyes				



Financial Report – Fiscal Year 2010

Revenue = \$53,491



REVENUE

Individual Support Revenue from individuals supporting the Foundation’s mission in FY10 totaled \$37,368 with an additional \$2,995 in royalties from the Westie Foundation Bank Of America MasterCard program, other Affiliate programs, and Program Fees, \$3,001 from Westie Gifts sales, \$7,375 from other fundraising efforts and \$2,802 in interest. Support from Westie lovers like you comprised the single largest source of revenue to the Foundation!

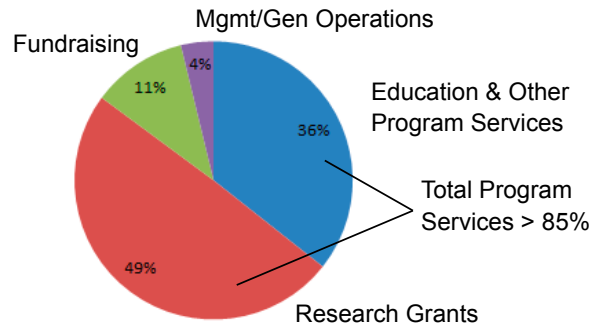
ASSETS

Endowment Funds All memorials and honorariums are added to the General Endowment Fund which now totals \$179,393. Through the legacies of Nancy Schoch and Daphne Gentry we also have significant funds dedicated to Pulmonary Fibrosis research and a veterinary scholarship. Our Endowment Funds total over half of our assets. The income from these funds may be used to fund projects, but the principal is temporarily restricted by the Board of Directors and invested carefully to maintain principal while bringing a respectable return.

Unrestricted Funds The Foundation has a cash balance of \$116,985 to fund operations, research and education.

Westie Gifts Westie Gifts closed the year with \$11,323 in cash and inventory valued at \$6,551.

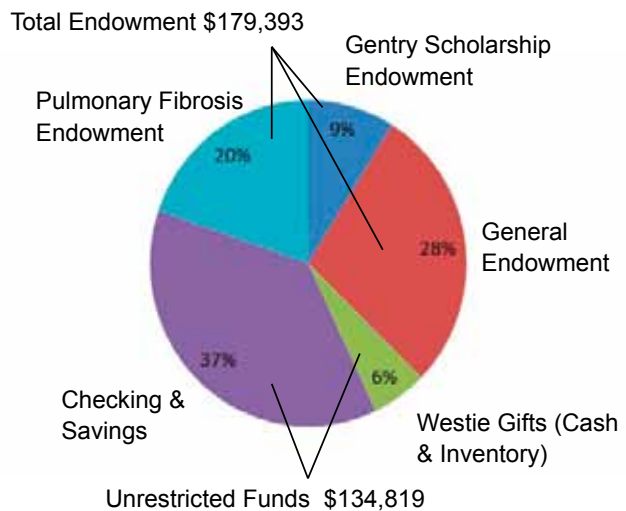
Expenditures = \$40,344



EXPENSES

Research & Education Last year, our expenses totaled \$40,344, with over 85% going directly to research and education, an increase from 77% last year. Funds spent on research were almost all matched by funds from the AKC Canine Health Foundation and Morris Animal Foundation, thus compounding the benefits our Westies will receive. Grants funded addressed Canine Cancer (\$11,000), Legg-Calve Perthes (\$1,450), Pulmonary Fibrosis (\$1,500) and Atopic Dermatitis (\$6,009). As always, operating expenses were kept to a minimum by careful allocation of resources and the fact that all officers, directors, and committee members are volunteers. These expenses were minimized to less than 15%, down from 24% in the previous year.

Assets = \$314,212



NOTE: IRS Form 990 EZ (Return of Organization Exempt From Income Tax) is available on line at our Web Site, www.WestieFoundation.org/about.htm, under "Public Disclosure".

Fundraising Report

Tina McCain VP of Fundraising

Our 2011 Montgomery County Raffle tickets have already gone out to all our regional clubs and rescue groups. With your help we will have another amazing raffle turnout. The two prizes this year are a beautiful Amish quilt and an Apple iPad. In case you know of anyone who did not receive an opportunity to participate in this year's raffle, we have included a copy of the raffle ticket in this newsletter. All raffle tickets should be filled out and mailed to Kim Smith, 30306 Olympic Street, Castaic, CA 91384. The raffle tickets are \$10, per chance.



We are also working on some new Montgomery County / Kimberton sales table items. This year's items will showcase the new WFA logo for the first time on Westie Gifts items! Look for a sneak preview in our next newsletter!



Have you become a WFA Facebook fan? From your Facebook homepage, search "Westie Foundation" in the search box, go to the Westie Foundation page, and click on the "like" button! Thank you in advance for "liking" the WFA!

Don't forget that you can help the Westie Foundation whenever you shop on line. Amazon, Café Press, Best Buy, Hunting Horn – Designer Jewelry for Dog Lovers, iGive.com, The Woofgang, Terrier Toys & Peakdale Sculptures are our Affiliates online retailers. Whenever you are looking to purchase something online, please remember to **go through the Westie Foundation website and click on any of the Affiliates** listed, then the WFA will get a percentage of your purchase. Everyone can be a WFA supporter shopper!

Name _____
Address _____
City/State/Zip _____
Phone # _____



2011 Raffle Drawing

Your chance to win 1 of 2 prizes

1. Amish Quilt
2. Apple iPad

\$10 per chance

Drawing to be at Montgomery 2011
Winner need not be present to win
Board, Advisory members and their spouses not eligible to win.

Dear Readers,

Unfortunately it seems that our Westie Wellness readers have not yet received their copy of the Spring 2011 issue unless they've received it by email. Our printer mailed copies to those who wish to receive the hard copy from the Harrisburg, PA post office early March. We can only assume that the spring newsletters are sitting in a USPS warehouse somewhere. For that reason we feel it's only fair to repeat the Westie Cartoon Caption Contest that appeared in the spring issue and the winner and runner-up of the winter issue cartoon caption contest. A few extra copies of the spring Westie Wellness issue are available. If you'd like to have a copy to complete your library, please contact Gail Krieger at gailaurie@hotmail.com. Please give your street address or an email address. Please accept our apologies for this inconvenience.



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Westie Cartoon Caption Contest

Create the winning caption for this Westie cartoon. Please send your caption to bjpinter@msn.com before July 30, 2011. The winner and runner-up will be announced in the next newsletter with their captions.

Create a Caption for this Cartoon



Copy of original watercolour by Ruth Sutcliffe, England



Winners of Last Cartoon!

WINNING CAPTION

by Paula Autin

“Westie Wonderland!

**Bright Colored Packages tied up with Strings
These are a few of my Favorite things.”**

RUNNER-UP CAPTION

by Doris Slaboda.

“Are you sure you heard rats instead of hat? I don't find them anywhere?”

