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Hemolytic Anemia in Dogs
 By Dr. Leah Cohn

This article has been provided courtesy of Petplace.com (www.petplace.com), the definitive online source for pet news, health, and wellness information.

Hemolytic anemia is a disease process in which the red blood cells, the cells that carry oxygen and impart a red color to blood, are destroyed, resulting in a decreased number in the bloodstream. Red blood cells supply the body with oxygen, so when there are fewer of them, the animal lacks energy and tires quickly. Hemolytic anemia is often a rapidly life-threatening condition.

and these conditions may lead to premature destruction of the abnormal red blood cells.

What to Watch For

- Weakness or tiring more easily than normal
- Breathing more rapidly than normal
- Very pale pink or white gums
- A yellow tinge to the gums or the whites of the eyes
- Discolored urine

General Causes

- Although there are a number of potential causes for hemolytic anemia, the most common is a disease known as immune mediated hemolytic anemia (IMHA). In this disease, the body's immune system, which is designed to kill germs, instead begins to kill the animal's own red blood cells.
- Some types of germs and parasites infect the red blood cells directly. These infections can result in destruction of the red cells.
- Certain toxins can also cause destruction of red cells. These include drugs like Tylenol, foods like onions, and metals like zinc, which is found in a surprising number of common items, including pennies.
- Mechanical damage to the red blood cells can also result in their destruction. This can occur as a result of the cells being passed through twisted or damaged red blood cells.
- There are hereditary diseases in which the red blood cells do not work normally,

Diagnosis

- Your veterinarian will begin by asking detailed questions about what you have noticed that is out of the ordinary, and when these changes began. Also, expect questions about your pet's diet, his elimination habits and the color of the stool and urine, any medications, including herbal supplements, your pet may be receiving, and when the most recent vaccinations were given.
- Your veterinarian will complete a physical examination. This will include looking for evidence of bleeding, evaluating gum and eye color, listening to the heart and lungs, and palpating for swellings or organ enlargement.
- A complete blood count (CBC) is essential in the evaluation of any animal with suspected anemia. This includes both a count of the various blood cell types,

MSRH Mission Statement

Miniature Schnauzer Rescue of Houston, Inc. is an all volunteer, donation sponsored, non-profit organization dedicated to the overwhelming task of saving the lives of abused, abandoned or unwanted Miniature Schnauzers who, through no fault of their own, have lost their homes. Many of these dogs come to us healthy. However, some are sick, injured, or abused. They come from shelters, off the streets, from owners who, for whatever reason, can no longer care for them, and from puppy mills, where they have never felt the loving security of a home. Our goal is that they will never have to feel unwanted or unloved again.

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and an evaluation of the shape and size of the blood cells. It may also show parasites infecting the red cells.

- A packed cell volume (PCV) or hematocrit is a simple measure of red blood cells.
- A serum biochemical profile may be performed to evaluate organ function and the balance of salts in the body.
- A urinalysis detects byproducts of red blood cell breakdown in the urine, as well as assessing kidney function.
- A Coomb's test uses a small amount of the animal's blood to look for evidence that the immune system is causing the red cell destruction, or hemolysis.
- Radiographs (X-rays) may be taken to look for evidence of metallic objects like pennies in the animal's stomach, or for evidence of enlarged or twisted organs.
- Specific tests may be indicated to look for infections of the blood. These usually involve submitting a blood sample to a special laboratory.
- Other tests may be indicated for an individual animal.

Treatment

- Blood transfusions may prove life saving. Either fresh blood or a concentrate of red blood cells may be administered through an intravenous catheter.
- Artificial blood products may be used in place of real blood transfusions. These are not completely man-made, but are derived from components of cow blood.

- Because immune system destruction of the blood is the most common cause of hemolytic anemia, animals will often be treated with corticosteroids to suppress the immune system.
- Intravenous fluids may be indicated, whether or not the animal receives a blood transfusion.
- Other treatments depend on the correct identification of the cause for hemolysis. For instance, if small, coin-shaped pieces of metal are revealed in the stomach on X-rays, they will need to be removed either with an endoscope, which is a fiberoptic tube passed through the mouth into the stomach, or via surgery.

Home Care

If the gums are noted to be pale or white and the animal appears weak, seek emergency veterinary assistance. Minimize exercise and exertion while the pet is anemic. Administer prescribed medications exactly as directed for the length of time specified.

Return your pet promptly for any recommended follow-up examinations and blood tests.

Information In-depth

Hemolytic anemia is a rapidly life-threatening condition. Many of the causes of red blood cell destruction progress quickly. After oxygen is inhaled into the lungs during breathing, it is transferred from the air to the red blood cells. These red cells then carry the oxygen throughout the body to all of the tissues. Because red blood cells carry oxygen to the tissues, when red cells are depleted, the body is basically starved for oxygen.

In addition to oxygen starvation, the destruction of the red cells (hemolysis) releases products from inside of the

cells. In large quantities, these products cause some of the signs associated with hemolytic anemia, like jaundiced gums and eyes and discolored urine, which can cause damage to the pet.

There are many causes of anemia other than hemolytic anemia. For instance, an animal may become anemic due to bleeding, or may become anemic when the body makes insufficient quantities of new red blood cells.

Appropriate treatment depends on an accurate diagnosis as to cause. The success rate for the treatment of hemolytic anemia depends on the cause. Some types respond very well to treatment, while others respond poorly even with appropriate treatment.

Causes

As mentioned, there are many causes of anemia. The veterinarian's first task after identifying anemia is to determine if the cause is blood loss, insufficient production of blood cells, or hemolysis. Hemolytic anemia refers specifically to those causes of anemia which are due to destruction of the red blood cells.

- Bleeding is a common cause of anemia, which is not related to hemolysis. For instance, an animal that has bleeding stomach ulcers may be anemic, but it is not hemolytic anemia.
- Another type of anemia is due to insufficient production of red blood cells. Red blood cells are made in the bone marrow, or the soft center of bones. Decreased production of red cells may be caused by either disease inside the marrow such as cancer in the marrow, or by disease outside the marrow. For

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example, animals in kidney failure don't send normal signals to the marrow that it should make more red cells.

- The most common cause is a disease known as immune mediated hemolytic anemia (IMHA). In this disease, the body's immune system, which is designed to kill germs, instead begins to kill the animal's own red blood cells. This disease occurs far more commonly in dogs than in cats. It typically affects young to middle aged animals, with females affected more often than males. Certain dog breeds, including cocker spaniels, poodles, and Old English sheepdogs, are affected more often than other breeds.

- Some types of germs and parasites infect the red blood cells directly. These infections can result in destruction of the red cells. Some of these affect dogs more often than cats (Babesiosis), while others are far more likely to affect cats than dogs (for instance, Haemobartonellosis).

- Certain toxins can also cause destruction of red cells. These include drugs (like Tylenol, especially in cats), foods (like onions), and metals (like zinc, which is found in a surprising number of common items, including pennies and diaper rash ointments). When a very young puppy develops hemolytic anemia, it is more likely to be due to the ingestion of a toxin than to an immune mediated cause. Recently, there have been reported cases of anemia caused by skunk spray. The alkyl mercaptans and disulfides in skunk spray can cause oxidative damage to the red cells

causing Heinz-body hemolytic anemia in some dogs.

- Mechanical damage to the red blood cells can also result in their destruction. This can occur as a result of the cells being passed through twisted or damaged blood vessels. Examples include a severe and unusual form of heartworm infection, or a twisted spleen (splenic torsion).
- There are hereditary diseases in which the red blood cells do not work normally, and these conditions may lead to premature destruction of the abnormal red blood cells. These diseases are most often identified in purebred dogs, and the signs are usually not seen until the animals are young adults.

Veterinary Care In-depth

Diagnosis In-depth

Some diagnostic tests are considered essential to the evaluation of hemolytic anemia. Other tests may be essential to an individual animal, as indicated by the results of the animal's history, the physical examination, or preliminary test results. Expect the following to be performed in all cases of hemolytic anemia.

- Your veterinarian will begin by asking detailed questions about what you have noticed that is out of the ordinary, and when these changes began. Also expect questions about your pet's diet, elimination habits and the color of the stool and urine, any medications, including herbal supplements your pet may be receiving, and when the most recent vaccinations were given.
- Your veterinarian will complete a physical examination. This will include looking for evidence of bleeding, evaluating gum and eye color

(pale gums are found in all types of anemia, but a jaundiced appearance suggests hemolysis), listening to the heart and lungs, and palpating for swelling or organ enlargement.

- A complete blood count (CBC) includes both a count of the various blood cell types, and an evaluation of the shape and size of the blood cells. It may also show parasites infecting the red cells.
- A packed cell volume (PCV), or hematocrit, is a simple measure of red blood cells. Although a complete blood count will be necessary, because PCV is a very quick, simple inexpensive test, it is often performed while waiting for the CBC, or to follow changes in the red cell count on a daily basis.

- A serum biochemical profile will be performed to evaluate organ function and the balance of salts in the body. This simple blood test may provide clues about the cause of anemia.

- A urinalysis detects byproducts of red blood cell breakdown in the urine, as well as assessing kidney function.

The following tests are indicated in many, but not all, cases identified as having a hemolytic anemia.

A Coombs test uses a small amount of the animal's blood to look for evidence that the immune system is causing the red cell destruction. Antibodies are normally produced by the immune system to attach to and destroy germs. For unknown reasons, sometimes the immune system begins to make antibodies that attach to the red blood cells instead of germs. The Coombs test looks for antibodies attached to

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Hemolytic Anemia in Dogs *continued from Page 3*

red blood cells, and is particularly useful in the diagnosis of immune mediated anemia (IMHA).

- Antinuclear antibody (ANA) tests may be performed to look for further evidence of a misdirected immune system. A disease called systemic lupus erythematosus (SLE) is one cause of this misdirection, and an ANA test helps in the diagnosis of SLE, but does not specifically test for IMHA.
- Radiographs (X-rays) may be taken to look for evidence of metallic objects like pennies in the animal's stomach, or for evidence of enlarged or twisted organs. In addition, cancer sometimes triggers the immune system to destroy red blood cells, so radiographs may prove useful in looking for evidence of cancer in the animal's chest or abdomen.
- Ultrasound utilizes sound waves to form a picture of the internal organs. This test may be used in certain settings to determine the cause of hemolytic anemia. For instance, an ultrasound picture of the spleen may show twisted blood vessels, or an ultrasound picture of the heart may show a mass of heartworms stuck together blocking the flow of blood into the heart. This test may require referral to a specialist.
- Specific tests may be indicated to

look for infections of the blood. These usually involve submitting a blood sample to a special laboratory. Blood parasites are often visible under a microscope, but not always. Special blood tests may be needed to identify some of the hidden germs or parasites.

- Other tests may be indicated in a given pet. For instance, a genetic test may be used in a young, purebred dog suspected to have a hereditary cause for hemolytic anemia.

Treatment In-depth

One or more of the diagnostic tests described above may be recommended by your veterinarian. In the meantime, treatment of the symptoms might be needed, especially if the problem is severe. The following nonspecific (symptomatic) treatments may be applicable to some, but not all pets with hemolytic anemia. These treatments may reduce severity of symptoms or provide relief for your pet. However, nonspecific therapy is not a substitute for definite treatment of the underlying disease responsible for your pet's condition.

- Blood transfusions may prove life saving. Either fresh blood or a concentrate of red blood cells may be administered through an intravenous catheter. This transfused blood enables oxygen to be delivered to the tissues. Unfortunately, without stopping the cause of hemolysis, the

newly transfused cells will themselves be destroyed.

- Artificial blood products may be used in place of real blood transfusions. These are not completely man-made, but are derived from components of cow blood.
- Because immune system destruction of the blood is the most common cause of hemolytic anemia, animals will often be treated with corticosteroids to suppress the immune system. Corticosteroids, such as prednisone, are intended to slow down the immune system's attack on the cells. Treatment of immune mediated hemolytic anemia (IMHA) may require additional immunosuppressive drugs in order to control destruction of the cells.
- Intravenous fluids may be indicated, whether or not the animal receives a blood transfusion. This can support the animal during other treatments and lessen the likelihood of complications from hemolysis.
- Other treatments depend on the correct identification of the cause for hemolysis. For instance, if small, coin-shaped pieces of metal are seen in the stomach on x-rays, these will need to be removed either with an endoscope (a fiberoptic tube passed through the mouth into the stomach) or via surgery. Infectious causes of hemolytic anemia may respond to drug therapy.



SIGN UP FOR KROGER'S 2011 NEIGHBOR TO NEIGHBOR PROGRAM!

For the 2010 program year, MSRH received over \$1,900, because MSRH friends and family enrolled in the program. The 2011 program year started July 1, so if you haven't already enrolled, sign up today! All you need to do is go to:

http://www.msrh.org/wp-content/uploads/Kroger_2011-12_Neighbor_to_Neighbor.pdf

Print Kroger Customer Letter and take it with you to the store checkout stand. Ask the checker to scan the barcode on the letter together with your Kroger Plus Card. That's it. You're set for the rest of the year.

Featured Pet—Melanie



Melanie—loving and well-behaved!

Hi! I'm Melanie. I'm a female Mini Schnauzer with a unique salt and pepper coat. I have natural ears and a natural tail. I'm less than two years old and weigh about 18 lbs. I am a very good girl, completely house trained, and will go to the door when I want out. I am so good that my foster parents never put me in a crate. They gate me in the kitchen where I do just fine. I love to go on walks on a leash, and my groomer says I do great throughout the grooming process. I love to sleep on the human bed and love my squeaky toys. I do best in a house with no other pets. I will curl up next to you in the evening to watch TV. I love to be loved and will follow you from room to room. Adopt me and take me home with you! We'll become soulmates for sure!

Adoption Fee: \$450

Parker Road Animal Hospital

Benefits for you & Benefits for MSRH

As an adopter you will be entitled to a set discounted rate to support you in the care of your new family member:

- 10% Off- Examinations**
- Laboratory Diagnostics**
- X-rays/Imaging**
- Hospitalizations**
- Surgeries**
- **Parker Road will donate \$20.00 for each adopter's first visit back to MSRH**
- **Parker Road will also donate 5% of your total dollars spent back to MSRH after your first visit**

**6730 Airline Drive
Houston, Texas 77076
(713) 694-0552**



Parker Road Animal Hospital & Pet Resort
6740 Airline Drive
Houston, Texas 77076
Tel: (713) 694-0552
www.parkerroadpetresort.com

Be sure to mention that you are associated with MSRH when you board your dog at Parker Road Pet Resort and a donation of \$1 per day per dog will be made to MSRH. Not only will your dog be treated like royalty, but MSRH will be receive a benefit, as well.

WORLD RABIES DAY IS SEPTEMBER 28

VOLUNTEER SPOTLIGHT—CHUCK & ALLISON LIPSCOMB

Hi! We're Chuck and Allison Lipscomb. Chuck retired from ExxonMobil in March 2007, and shortly after the last of our three daughters graduated from high school and went off to college, we relocated to Cold-spring, Texas, near Lake Livingston and began enjoying retired life. Chuck is highly allergic to most animals and has asthma. I grew up with indoor dogs and thoroughly enjoyed having them close by, but during our married life we could only have outdoor animals due to his health issues. Our oldest daughter, Amy, got a Puggle in 2008, and we ended up babysitting for a few months in 2009 while she began her nursing career. He was indoors with us for three months, and Chuck and I both thoroughly enjoyed him, even though he shed. I kept the hair vacuumed to try to minimize the impact on Chuck. Through all this, we decided we would love to have an indoor dog if we could find one that didn't shed.

We did in-depth research to learn which breed would be best suited for our lifestyle, and decided on the Schnauzer. We looked at breeders, but have always had a heart for rescue dogs (our outdoor dog, Shadow, came from the SPCA), so we found MSRH online and began looking. Once approved, we poured over the website daily, but couldn't find what we were looking for (although I don't think we really knew what we were looking for) and finally decided to take a break for a while. We were about to close on our house in Houston and move everything into storage while we built at the lake, so it seemed to make sense to wait. I was addicted to the website and those precious dogs, though, and couldn't help, but keep looking. That's when "Coco" appeared. He was the cutest little silver Schnauzer with natural ears and a docked tail, and only 18 months old. He looked so perky in the pictures, and I knew he was the one. We weren't able to go meet him for a few days due to the mover schedule, and when we finally got there it was love at first sight. I found out another group came to meet him, but he hid under the table the whole time they were there! Good boy!!! We adopted him, renamed him Max, and he has been our baby ever since. He is the best dog either of us has ever had, and we couldn't be happier.

In the last two years we have toyed with the thought of getting a second baby. I have scanned the MSRH website over and over, finding many dogs that would be perfect, but never went through with adopting one. Then one day I thought, maybe we should foster instead. So after getting Chuck's approval, that is what we did, and we've been hooked ever since. Many friends (and my husband, too) were a little skeptical that I was going to be able to let the foster go in the end, but so far I've been just fine until Chispita came along. She stole our hearts and is the newest addition to our family. Though there were a few tears each time we said goodbye to a foster, the joy and reward of watching them bloom and then find a wonderful family has overpowered any sadness at seeing them go. Fostering has really helped Max to get along with other dogs, and we let him "pick" the fosters by meeting them first. He adapts quickly when they come and when they go. Some worry that Max will be jealous, but I just remind them that someone in MSRH rescued him once, too, and it's time for us to give back.

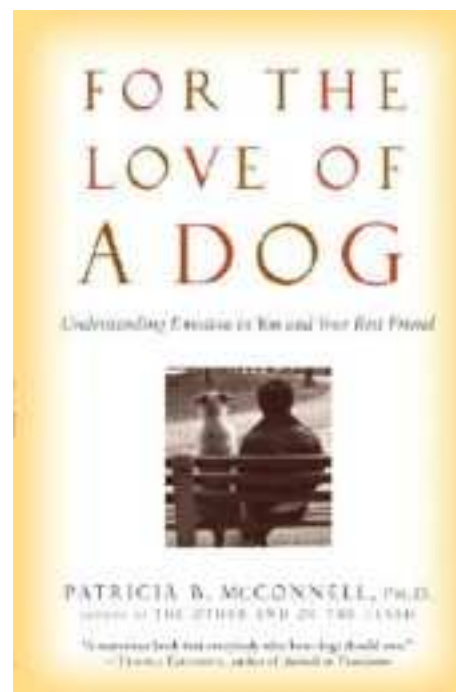


Allison & Chuck with Max

BOOK OF THE MONTH

"FOR THE LOVE OF A DOG: UNDERSTANDING EMOTION IN YOU AND YOUR BEST FRIEND

By Patricia McConnell, PhD.



Back in our April issue, we featured another one of Patricia McConnell's books, *'The Other End of the Leash: Why We Do What We Do Around Dogs'*. According to one reviewer, that book was great, but this one is even better and here's why:

It has an uncommon combination of three things that usually don't go together.

- 1) Entertaining and moving (yet educational) stories of dogs and their humans (many from McConnell's long career as an animal behaviorist).
- 2) Immediately useful knowledge about dog behavior and the "clues" dogs give about what is going on with them, and
- 3) Relentless scientific backup for what she says, while NOT being hard to read or "science-y."

For instance, do you know what it means if a dog's mouth is closed? Do you know what it means if a dog is pointing her muzzle away from you, but looking in your direction? Do you know what it means if a dog is pulling the corners of his mouth forward? You should, because these are critical clues about what the dog is going to do next—it may even prevent you from being bitten by the next dog you reach out to pet!

This book may be purchased from <http://www.amazon.com> in paperback for \$10.85, Kindle for \$11.99, or MP3 CD, Audiobook, MP3 Audio, Unabridged for \$18.99. As of this writing, it has received 95 customer reviews, with 80 of them 5-star.

ABOUT THE AUTHOR

Patricia McConnell, Ph.D., is an Adjunct Assistant Professor of Zoology at the University of Wisconsin-Madison and an expert applied animal behaviorist. Her company, Dog's Best Friend, Ltd., specializes in family dog training and treating aggression in dogs, and she is an immensely popular speaker around the country. She is the co-host of "Calling All Pets", an animal behavior advice show syndicated to a hundred public radio stations, and works daily with four dogs (three border collies and a Great Pyrenees) on her sheep farm outside of Madison. Her website is:

<http://www.dogsbestfriendtraining.com>

UPCOMING EVENTS

SATURDAY, OCTOBER 1, 2011 MEET & GREET NATURAL PAWZ

Chair: June Hensley
Where: Natural Pawz—514 W. 19th Street (The Heights)
Houston, Texas 77008—Store Phone (713) 864-4779
Hours: 11:00AM—1:00PM
Tel: (832) 667-1132 (work)
E-mail: hensley@rodeohouston.com

We will have a table set up in the store and will have some foster dogs available. We invite as many of our MSRH friends and family to come out to support us, as well as the store. Call June in advance if you want to bring your foster.

SATURDAY & SUNDAY OCTOBER 22 & 23, 2011 PETFEST

Chair: Karen Coleman
Where: Old Town Spring
Hours: Sat. 10AM—5PM; Yappy Hr. 4PM-9PM
Sun. 11AM—5PM
Tel: (832) 277-4904
E-mail: houstonschnauzerrescue@yahoo.com

Volunteers are needed to man the booth part or all day either or both days. Please bring fosters to meet the public.

For more details about our booth,
contact Karen

For more event details, go to:
<http://www.petfestoldtownspring.com>

THURSDAY, OCTOBER 27, 2011 HOWLAWEEN AT THE DOG PARK

Chair: Martha Sarrack
Where: Katy Dog Park
Katy, TX
Time: 6:00PM
Tel: (281) 829-3293 or (281) 825-8647
E-mail: minimarti65@gmail.com

Martha will have a table set up at this event and would love to see other MSRH volunteers come out to join her. Call her if you have questions or need directions to the park.

Admission into the park will be a bag of dog food, which will be donated to a local animal shelter.

There will be a costume contest and tricks and treats for your four-legged goblin.

SATURDAY, OCTOBER 29, 2011 MSRH FALL GARAGE SALE

Chair: Martha Sarrack
Where: 21714 Moortown Circle
Katy, TX 77450
Tel: (281) 829-3293 or (281) 825-8647
E-mail: minimarti65@gmail.com

Items are needed for the sale, so start cleaning out closets, attics, and garages. No clothing or books, but shoes, purses and accessories okay. Call Martha with questions.

Martha will start accepting deliveries beginning Saturday, October 1. All items must be clean and marked with a price.

RESULTS OF EVENTS PAST: Many thanks go to **Martha Sarrack** for attending the Yappy Hour at Happy Tails in Katy, TX, on August 26, from 6—8PM with her three fosters. We really appreciate that she made the effort to represent MSRH at this event.

Lone Star Photography will donate \$250 to MSRH when any regular priced wedding package is purchased by December 31, 2011 (wedding can take place in 2012). For more information, go to www.lonestarphotography.net or call (409) 789-3240.

Many Thanks To Our August Transport Volunteers!

MUCH APPRECIATION GOES TO: **Martha Sarrack** for picking up Cookie at Ft. Bend Animal Services on 8/1/11; **Sharon Rode** for picking up Quincy Lee, a stray, on 8/3/11; **Martha Sarrack** for picking up Triscuit at Ft. Bend Animal Services on 8/6/11; **Sherry Ragsdale** for picking up Starsky, a stray, on 8/9/11; **Sherry Eitel** for picking up Buckley at Harris Co. Animal Control on 8/10/11; **Carol Harrington** for picking up Shadow at LaPorte Animal Services on 8/16/11; Good Samaritan **Emily Crowley/Carol Harrington** for picking up Gilbey, a stray, on 8/16/11; Good Samaritan **Cendra Parks/Sherry Eitel** for picking up Hansel & Gretel, strays, on 8/16/11; **Sherry Eitel** for picking up Lexus at Harris Co. Animal Control on 8/17/11; and **Lynda Lucas/Gwinette Peeples** for picking up Daphne from Poodle Rescue.

From the Editor

Dear Readers:

Due to several health issues that have come up over time, among them the need for surgeries on each of my feet, I am going to have to resign as Editor of *The Schnauzer's Paw* for at least the next few months. If I should get things under control with medication to where I feel like my old self again, then I look forward to taking the role back over if it is still available. The reason I say that, is if any of you would like to take over as Editor, I would be happy to give you as much support as possible in getting started. For example, I can give you my resources for articles and tips based on things I have learned along the way.

And, by the way, if I think things are not going well for me, things could be worse. I am sure most of you have heard about Wayne and Connie Seagroves who live near Bastrop. Connie is a MSRH transporter for the Austin area. Their home recently burned to the ground. There was no firefighting crew available to stop it, so it burned at will. They lost their car, their kennels, and even their fireproof safe. Wayne was able to save five of their 6 pets, but he couldn't find the cat. They received a call later that the Austin Humane Society had the cat. He was badly burned, but will survive. Please keep the Seagroves in your thoughts and prayers.

If you still want to order cookbooks or Schnauzer Christmas ornaments, etc., you still can by going to the website as follows:

<http://www.msrh.org/category/resources/cookbook/>

<http://www.msrh.org/category/resources/merchandise/>

Sincerely,

Linda



Linda with Sophie & Barkley

AUGUST INTAKES = 13 ADOPTIONS = 22