

# Great Dane

## Update

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## Megaesophagus Is One of Top Health Concerns in Great Danes

**W**hen Cheryl Rifkin of Ventura, Calif., visited a breeder to choose two Great Dane puppies as pets, she knew that the fawn-colored male with a black mask was not expected to live more than a few months. At 2 weeks old, he was one of two puppies from his litter diagnosed with the potentially fatal condition congenital megaesophagus.

Undeterred by the prospect of providing special care to the Great Dane puppy, Rifkin and her husband decided to take home "Murphy" and a littermate sister that was not affected by the disease.

"Though Murphy was given only four months to live, I wanted to do what I could to give him a normal life," Rifkin says. "He is now 7 years old, and though it hasn't been easy, I've gotten on top of this illness by working carefully with my veterinarian and researching ways to help affected dogs."

Great Danes are among a dozen breeds genetically predisposed to megaesophagus. Other affected breeds include Dachshunds, German Shepherd Dogs, Miniature Schnauzers, Rhodesian Ridgebacks, and Wirehaired Fox Terriers. In Miniature Schnauzers, the disease is thought to have an autosomal dominant mode of inheritance, which means affected dogs inherit a copy of the gene mutation from an affected sire or dam. Wirehaired Fox Terriers appear to inherit a copy of an autosomal recessive gene mutation from both their sire and dam, which are unaffected carriers.

The disorder is caused when the esophagus, the long tube connecting the throat to the stomach, fails to move food into the stomach. Congenital megaesophagus usually is diagnosed during weaning, when puppies are between 6 and 8 weeks old. Affected puppies exhibit signs of the condition when solid food is introduced. Coughing and regurgitation of food and water are common.

One expert, Neil O'Sullivan, Ph.D., of Adel, Iowa, a geneticist who breeds Great Danes under the Flighty prefix, says, "Megaesophagus affects one puppy in 20 percent of Dane litters.

In some bloodlines, the disease occurs in every litter. It absolutely is a heart-breaking disease because affected puppies often must be euthanized. Breeders are highly motivated to find a solution."

### How to Participate in Megaesophagus Research

**B**reeders and owners of Great Danes, particularly puppies, affected by megaesophagus are encouraged to submit DNA samples for genetic research to identify a marker for the potentially fatal neuromuscular disease. The research is supported by the Great Dane Club of America.

For information about participating in the studies at Clemson University, please contact Leigh Anne Clark, Ph.D., assistant professor in the Department of Genetics and Biochemistry at [lclark4@clemson.edu](mailto:lclark4@clemson.edu).

J.P. Yousha, chairwoman of the Health and Research Committee of the Great Dane Club of America, says the parent club considers megaesophagus one of the top health concerns in the breed. "Breeders and owners face difficult choices when they discover a puppy with megaesophagus," Yousha says.

"Probably one-third of puppies diagnosed with this disease will improve, but all 'mega' puppies are high maintenance due to the cost of their care. Breeders must grapple with what to do with the sire and dam when they produce an affected dog. This is why the parent club is supporting megaesophagus research. Hopefully, one day breeders will have a genetic testing tool to avoid producing puppies with this heart-wrenching disease."

Cathy De La Garza, of Houston, an AKC judge who breeds Great Danes under the Stonehenge prefix, laments about how emotionally difficult it is to breed an affected dog. "Megaesoph-

agus puppies are very skinny and always stunted in growth, yet they have the best personalities," she says. "It is such an emotionally draining experience. It is not fair to offer these puppies as pets because most people do not understand the responsibility and costs associated with a megaesophagus puppy. I would love to see a DNA test for this disease."

### Seeking a Genetic Marker

Research to discover the genetic marker for megaesophagus in Great Danes has just begun at Clemson University in South Carolina. Leigh Anne Clark, Ph.D., assistant professor in the Department of Genetics and Biochemistry, aims to apply information learned about the disease in German Shepherd Dogs to Great Danes. A study of 180 German Shepherd Dogs, which included 18 affected dogs, identified a region likely to contain a marker for the disorder.

"We confirmed that megaesophagus is not a simple autosomal disease in German Shepherd Dogs," Clark says. "It is complex. We hypothesize that it is a dominant autosomal disorder with incomplete penetrance. This means that the disease can be inherited from the sire or dam and that it does not occur 100 percent of the time. If we are successful in identifying a marker, and later the causative mutation, we may one day have a genetic test for megaesophagus in Great Danes that will allow breeders to identify dogs that are carriers. Then, they can plan breedings that will not produce affected puppies."

In future genetic research, Clark plans to study DNA samples from affected and healthy Great Danes using single nucleotide polymorphism (SNP) chip analysis. Eager to support the research, Rifkin sent Murphy's blood sample to the researchers. The samples will undergo genomewide analysis to help identify candidate genes that may contain the gene mutation. SNP chips allow researchers to focus on a small area of the canine

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## Megaesophagus

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genome as they compare profiles of affected and healthy dogs. The regions of difference help to distinguish the location of disease genes.

Though the initial goal is to identify a genetic marker rather than the mode of inheritance, learning the inheritance pattern should come easily once a marker is identified. "If we can identify a single association between a marker and megaesophagus, it will allow us to trace the marker through families and potentially determine the mode of inheritance," Clark says.

"We know the disease is inherited differently among different breeds, thus it may be caused by mutations in different genes or by different mutations in the same gene. The mode of inheritance is determined by the mutation and its effect on the protein."

### A Neuromuscular Disease

Besides being a congenital condition, megaesophagus can occur secondary to other conditions, such as myasthenia gravis, a neuromuscular disease that causes muscle weakness and fatigue, and Addison's disease, a disorder caused by insufficient production of adrenal hormones. Megaesophagus can be confused with geriatric onset laryngeal

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paralysis polyneuropathy, a progressive nerve disease that causes regurgitation.

When normal dogs eat food, the muscular walls of their esophagus progressively contract from the upper esophagus downward to the stomach. This process, called peristalsis, pushes food into the stomach. The swallowing sequence is completed when the sphincter relaxes to allow food to enter the stomach.

In comparison, megaesophagus-affected dogs have an absence of the peristaltic esophageal muscle contractions and thus ingested food moves into the stomach only as a result of gravity. Because the sphincter does not relax in response to swallowing, food stays in the esophagus anywhere

from several minutes to hours, causing the tube to dilate or stretch out until the sphincter relaxes and food passes into the stomach in response to the dilatation pressure. Hence, the condition is called megaesophagus.

A definitive diagnosis of this disorder usually is made from radiographs taken after a dog has undergone a barium swallow test, in which a contrast agent helps make the abnormality easy to recognize. Radiographs of the esophagus help to distinguish the condition from diseases that mimic megaesophagus and require different therapies.

Megaesophagus ranges from mild to severe. Mildly affected dogs may not show signs other than occasional regurgitation or coughing. Moderately to severely affected dogs may suffer from malnutrition, excessive salivation and physical wasting, with frequent signs of coughing or wheezing. Severely affected dogs essentially have a non-functioning esophagus. Regurgitation is most common, although owners sometimes mistake regurgitation for vomiting. Regurgitation is the passive expulsion of undigested food, whereas vomiting is the forceful ejection of stomach contents. The primary life-threatening effect of megaesophagus is aspiration pneumonia, which is the leakage of food, water or saliva into the lungs.

Treatment consists of trying to help food reach the stomach. Veterinarians may recommend feeding dogs from an elevated or upright position so they are as vertical to the ground as possible to take advantage of gravity to help pull food down into the stomach. In severe cases, a gastronomy tube can be inserted through the skin and wall of the abdomen directly into the stomach to get nutrition into the stomach.

Many dogs diagnosed with the disorder die or are euthanized within weeks or months. The neuromuscular abnormality is considered idiopathic, meaning it occurs for unknown reasons. Possible causes include failure of the nerve supply and/or muscles of the esophagus to develop properly, thus interfering with the sphincter relaxation process that allows food to pass into the stomach.

Murphy, Rifkin's Great Dane puppy, had aspiration pneumonia four times in his first year. Until Murphy was 6 months old, Rifkin held the puppy with his head over her shoulder for 20 minutes when she fed him to help ensure food moved to his stomach.

As Rifkin learned more about how to care for dogs with megaesophagus, she began practicing upright feedings, placing Murphy's food bowl on a ladder, with the dog standing on a lower step at a 45-degree angle, to help maximize the aid of gravity. She began limiting Murphy's food to three cups of food per feeding, adding rice and cooking the food to an oatmeal consistency to aid its passage through the esophagus. Rifkin began adhering

to a strict feeding routine, allowing 12 ½ hours between feedings for digestion to help prevent regurgitation.

Though Murphy has experienced aspiration pneumonia and regurgitation, the care Rifkin has given the dog has helped the Great Dane outlive early

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life expectancy predictions. "We've enjoyed seven years together," Rifkin says. "Though there were a couple of times when Murphy was so sick with pneumonia I feared I would have to put him down, we've made it through them. My husband died when Murphy and his sister were 6 months old, and I don't know how I wouldn't have gotten through that without them. Caring for Murphy has been a labor of love." ■

Purina appreciates the support of the Great Dane Club of America and particularly J.P. Yousha, chairwoman of the GDCA Health and Research Committee, in helping to identify topics for the *Purina Pro Club Great Dane Update* newsletter.

### Want to Reach the Editor?

Have comments about *Purina Pro Club Update*? Send them to us at: *Purina Pro Club Update*, c/o Editor, Nestlé Purina PetCare, 2T Checkerboard Square, St. Louis, MO 63164 or via e-mail at [today'sbreeder@purina.com](mailto:today'sbreeder@purina.com).

### Send Us Your Questions

Have questions about your Purina Points or how to redeem weight circles for rewards and rebate checks? Contact *Purina Pro Club* at (877) PRO-CLUB, or (877) 776-2582, between 7 a.m. and 5 p.m. CST Monday through Friday. You also may visit [www.purina.proclub.com](http://www.purina.proclub.com) to review and redeem Purina Points.

## Purina Pro Plan Takes Main Stage at National Pheasant Fest & Quail Classic

Tips from top professional trainers of retrieving, flushing and pointing breeds are among the featured activities planned at the National Pheasant Fest & Quail Classic Feb. 17 to 19 at the Kansas City (Mo.) Convention Center. *Purina Pro Plan* is the national dog food sponsor of the annual event that draws more than 20,000 people.

The professional trainers, who are Purina consultants, will hold seminars on the Main Stage of the Bird Dog Bonanza area. Tom Dokken of Dokken's Oak Ridge Kennels in Northfield, Minn., will offer retriever training tips. Rick Smith of Cozier, Va., who developed the Silent Command System of dog training, and his cousin, Ronnie Smith, will present guidelines on training pointing and flushing breeds.

Bob West, Director of Purina's

Sporting Dog Group, will emcee panel discussions in which the trainers will answer questions from attendees.



"We are excited to invite our Purina consultants to this event and to share their expertise on conditioning and training dogs," West says. "At the Purina booth, we will have experts on hand to discuss nutrition and care for hardworking dogs."

The largest trade show in the country for pheasant and quail hunters

and bird dog enthusiasts, the event will feature wildlife conservation, upland game bird hunting and wildlife habitat management and restoration. About 30 sporting dog breeds are expected to be represented by breed clubs and trainers on Bird Dog Alley.

Purina and *Pro Plan* was named in early 2011 as the national dog food sponsor of Pheasants Forever and Quail Forever, the largest nonprofit organization in the country dedicated to upland habitat conservation and one in which seven of 10 members own dogs. The agreement renewed Purina's more than two decades' support of Pheasants Forever, which was founded in 1982 by avid pheasant hunters and conservations. Quail Forever was launched in 2005. ■

### 2011 Pro Plan Champions Cup Standings

Dog	Breed/Variety	Points Earned*
GCH Casablanca's Thrilling Seduction	Black Cocker Spaniel	315
GCH Palacegarden Malachy	Pekingese	228
GCH Saks Hamelot Little Drummer Boy	Bichon Frise	174
GCH Cragsmoor Buddy Goodman	Skye Terrier	171
GCH Winfall Brookwood Styled Dream	Boxer	167
GCH Banana Joe Van Tani Kazari	Affenpinscher	166
GCH Starline's Chanel	Whippet	151
GCH Northgates As You Like It	Pharaoh Hound	140
GCH Babheim's Captain Crunch	German Shepherd Dog	132
GCH Szumeria's Wildwood Silver Six Pence	Kuvasz	117

\*Points earned through November 30, 2011.

### Purina-Sponsored Sporting Events January to March 2011\*

Event	Date	Location
United Kennel Club (UKC) Grand American	Jan. 6 - 7	Orangeburg, SC
U.S. Complete Shooting Dog Association (USCSDA) National Open Championship	Jan. 12 - 15	Cheraw, SC
Continental Championships	Jan. 16 - 28	Greenville, FL
National Bird Hunters Association (NBHA) Invitational Championship	Jan. 20 - 23	Oneonta, AL
UKC Winter Classic and Purina Coonhound Awards	Jan. 27 - 28	Albany, GA
All-American Foxhound Championship	Feb. 3 - 5	Grenada, MS
NBHA National Amateur Championship	Feb. 10 - 12	Wheatstone, MO
National Championship	Feb. 13 - 26	Grand Junction, TN
National Pheasant Fest & Quail Classic	Feb. 17 - 19	Kansas City, MO
UKC Southeastern Treeing Walker Days	Feb. 23 - 25	Salisbury, NC
National German Shorthaired Pointer Association (NGSPA) National Championship	Feb. 24 - Mar. 4	Booneville, AR
NBHA National Open	Feb. 29 - Mar. 4	Cheraw, SC
USCSDA Futurity	Mar. 7 - 8	Sandland Wildlife, West End, NC
American Kennel Club Brace Beagle Southern Federation	Mar. 9 - 14	Rock Springs, GA
American Hunting Basset Association (AHBA) World Hunt	Mar. 16 - 17	Lynville, IN
Mid-America Brace Gundog Federation (MAB) All-Age National Run-Off	Mar. 24 - 25	Booneville, IN
NBHA Futurity	Mar. 26 - 29	Nashville, TN

\*This table lists some, but not all, upcoming sporting events sponsored by Purina.

## Purina Pro Plan Sponsors the 2012 Westminster Kennel Club Dog Show

New in 2012 at the Westminster Kennel Club Dog Show, dog handlers and enthusiasts arriving for the 136th annual show will notice signature purple *Purina Pro Plan* banners decorating Madison Square Garden in New York City.

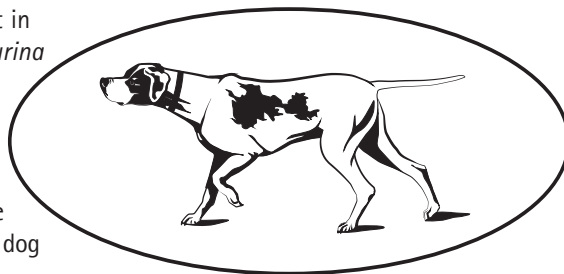
As the official pet food sponsor of the prestigious dog show, *Pro Plan* will reach out to the dog fancy and millions of people watching the televised program live on USA Network. Purina and the Westminster Kennel Club announced the multi-year sponsorship agreement last June.

"Westminster is a marquee dog show well known around the world," says Candy Caciolo, Purina Portfolio Director of Specialty, Breeder and Pet Acquisition. "Many Westminster win-

ners, including the last five Best in show winners, have been fed *Purina Pro Plan* brand dog food, so it's fitting for Purina to partner with this distinguished kennel club."

A longtime supporter of the dog fancy, Purina sponsors more than 100 all-breed and specialty dog shows a year. In 2010, Purina unveiled the Purina Event Center, a \$15 million, 84,000-square-foot indoor dog show facility in Gray Summit, Mo., where six Westminster Best in Show winners, along with their owners and handlers, participated in the Grand Opening.

Purina's support of the fancy contributed to the decision by the Westminster Kennel Club to choose Purina as the sponsor of its dog show. "Purina



was selected due to its stature in the pet industry and visibility at dog shows," says David Frei, Director of Communications for Westminster. "Purina will be a very active partner, not just during the dog show but year-round."

Founded in 1877, the Westminster Kennel Club Dog Show is the oldest organization in the country dedicated to the sport of purebred dogs. The 2012 dog show will be held Feb. 13 and 14. ■

### Purina-Sponsored Dog Shows January to March 2012\*

Event	Date	Location
Kennel Club of Palm Springs Dog Show	Jan. 5 - 8	Indio, CA
Land O'Lakes Cluster	Jan. 6 - 8	St. Paul, MN
Florida Classic Cluster I & II	Jan. 12 - 22	Brooksville, FL
Orange Empire Kennel Club Dog Show	Jan. 27 - 30	San Bernardino, CA
Cherokee Rose Cluster	Feb. 2 - 5	Atlanta, GA
Westminster Kennel Club Dog Show	Feb. 13 - 14	New York City, NY
Foothills Dog Show Circuit	Feb. 17 - 19	Spartanburg, SC
Rocky Mountain Cluster	Feb. 17 - 20	Denver, CO
International Kennel Club (IKC) of Chicago Dog Show	Feb. 23 - 26	Chicago, IL
Fiesta Cluster	Mar. 2 - 5	Scottsdale, AZ
Belle City Cluster	Mar. 3 - 4	Purina Event Center Purina Farms Gray Summit, MO
March Madness Cluster	Mar. 22 - 25	Edison, NJ
Fort Worth Cluster	Mar. 23 - 25	Fort Worth, TX

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PURINA Pro Club Great Dane Update

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