



Geoffrey Marsh <gdotmarsh@gmail.com>

Re: Sample ID: 3503305 - Letzty [ref:_00Di0ljJl._500i06G6gf:ref]

1 message

Customer Care Support Email <customercare@marsveterinary.com>

Wed, Feb 12, 2014 at 9:04 PM

To: "gdotmarsh@gmail.com" <gdotmarsh@gmail.com>

Dear Geoffrey,

Thank you for contacting Mars Veterinary, the creators of **Wisdom Panel® 2.0** and **Wisdom Panel® Professional** DNA tests, the gold standard in genetic breed identification for dogs.

Thank you so much for sending us photos of Letzty. At this time, please allow me to explain the report and provide some additional information on the test and physical traits in relation to breed signatures (breeds detected).

We have tried to present the results of our **Wisdom Panel®** DNA tests in a format that customers will understand. Additionally, we have sought to provide guidance as to which of the reported ancestral breeds are likely to account for the most significant genetic influence as these in turn may potentially impact the dog's physical appearance and behavior. The stronger the breed signal detected, the greater proportion of that breed's genome has been inherited increasing the likelihood that traits from the breed will be detectable. However, we must avoid absolute certainties as it is possible that a breed present in significant amounts might have subtle visible effects on the dog's phenotypic (genes that control appearance) traits due to the unique combinations with genes from other breeds present in the mix.

All breed determinations are made solely by our proprietary computer algorithm. With each tested dog's DNA, more than 7 million repetitive comparisons are made using a complex statistical algorithm. The algorithm scans the 321 genetic markers collected and looks for matches to breed signatures (Letzty's sample was of good quality and matched to almost 95% of the genetic markers we use for breed identification). The computer then provides a complex numerical score for each breed (how good the match to the breed was at each marker) as well as a prediction of the relative amount of each breed detected. It then

selects the single best combination of breeds and relative amounts of breeds detected that best match the tested DNA sample from this comparison with our extensive database of purebred AKC dog breed signatures. The **Wisdom Panel**® tests' breed signatures are defined by markers that are consistent with the presence of the breed, but not necessarily markers associated with physical appearance. Therefore, a mixed-breed dog could be a combination of three or four breeds but have few traits that are visible from one or more of the called breeds.

The categories listed on Letzty's report can be interpreted the following way:

Parent: A breed that represents approximately 50% of your dog's DNA. You are likely to see the most physical and behavioral traits from this breed. Dogs with mixed-breed parents will not have a breed represented at this level.

Grandparent: A breed that represents approximately 25% of your dog's DNA. You may see some physical and behavioral traits from this breed. Dogs with a very mixed ancestry may not have a breed represented at this level. The Bluetick Coonhound was detected at this level.

Great-Grandparent: A breed that represents approximately 12.5% of your dog's DNA. You are unlikely to see many traits from this breed unless they are dominant. The Chow Chow was detected at this level. However, it was detected at a trace confidence which means that it is hovering between the great-grandparent and fourth-generation ancestor levels (having contributed somewhere between 6.25% and 12.5% of Letzty's DNA).

Therefore, only around **37.5%** of Letzty's genetic profile was detectable, leaving **62.5 %** too mixed to detect a dominant purebred dog within the last three generations.

Each side of the report reflects one of Letzty's parents (mom and dad); though we cannot say which side is mom and which is dad. Again, what we are looking for when testing a mixed breed dog is the presence of purebred dogs within the past three generations, though there may have been mixed-breeds present in those generations as well (the mixed breed tags you see denote ancestors who were mixed beyond these three generations). The "What Does The Mixed Breed Ancestry Mean For Letzty" section, on page 6 of the report, includes some breeds, or breed groups, that the algorithm feels *may or may not* be present in the mix, though establishing the statistical significance of these matches is beyond our test's statistical ability at this

time.

An important thing to keep in mind is that humans don't always inherit all their parent's traits and this is the same with dogs. Some mixed breed dogs are a combination of all the breeds in their makeup and won't necessarily look like any one breed in particular.

In 1965, researchers Scott and Fuller bred a purebred Basenji to a purebred Cocker Spaniel and were shocked by the appearance of the F1 (first generation) dogs that were produced. For your consideration, I am attaching a picture of the dogs. On the left side of the picture are the mother and father, and on the right are two of their offspring. The combination of dominant and recessive genes gave these puppies unique appearances that don't resemble the parents.

We understand that it can be confusing not to "see" breeds that we feel make up our dogs and just as confusing not to "see" the breeds that genetically influence them either! However, we like to refer to dogs as products of their genes and not products of their breeds. Unfortunately, what a dog "looks" like is not always what a dog appears to be. Research using shelter personnel has shown that visual identification of a mixed-breed dog's ancestry was only accurate approximately 25% of the time – in other words 75% of the time, they could not even identify a single correct breed in the dog's ancestry and furthermore, 87.5% of the time, their "guesses" were incorrect (sometimes they called more than one breed in a dog, hence the difference in the numbers). I am attaching a copy of the report to this email if you are interested in reading more about the study. To further illustrate this point, I am attaching a photo of Fulmer, an associate's dog, who recently tested with us. By all accounts, he looks to be a black lab and was labeled as such by the shelter he was adopted from. However, when the results came back, we detected Miniature Poodle, Beagle and distant traces of Treeing Walker Coonhound but no Lab! A classic trait of the Miniature Poodle is that they are non-shedders and are dander free, which was passed down to Fulmer since he doesn't shed at all.

Please do not misunderstand, Veterinarians and shelter personnel worldwide do the best they can to identify a dog's breed using what tools and knowledge they possess. They identify traits in a dog and try their best to tie those traits to a certain breed; however, the combination of dominant and recessive genes can often mimic those seen in other purebred dogs. They are therefore making an educated guess.

Just to be sure, I ran an analysis that compares Letzty's genetic profile to that of the Rottweiler and have attached the resulting graph for your consideration. Letzty is represented by the small blue dot that is grouping among the red, mixed dog group. However, as you can see, she does not group at all near the green dots representing the Rottweiler's genetic profile.

Letzty's Traits:

****NOTE**** A dominant trait means that a dog only needed to inherit one copy of the gene (from any of its ancestors) in order to express it. A recessive trait means that they would have needed to inherit two copies of the gene (one from their mother's side of the family tree, and one from their father's side) in order to express it. More often than not, a dominant trait will be expressed over a recessive trait.**

Letzty's coat color

- Letzty expresses the black and tan coat pattern which is commonly called tan points and is a recessive trait. The Bluetick Coonhound does carry this trait and could have passed on one copy, while Letzty would have received the second copy from her mixed portion. Her "Next 5" does contain breeds or breed groups that commonly have tan points.

Letzty's coat length

- Letzty has a short coat length which is a dominant trait. Not only does the Bluetick Coonhound have short hair as a dominant trait, but Letzty could have received this trait from any other of the mixes present in her make-up.

Letzty's ears

- Letzty exhibits base erect ears, which occur when there is more cartilage in the base of the ear than in the pinna, causing the ear to fold over on itself. This is a variation of the dominant drop ear trait and can occur when a mixed breed dog has ancestors with drop ears (the Bluetick Coonhound) but also has the influence of ancestors with upright ears (the Chow Chow).

Additional traits

- Additionally, you may be interested to know that the overall shape and size of a dog's ears, their position on the head, as well as the overall facial structures such as muzzle length and brow width are the result of all the ancestors working together towards the average.
 - Interestingly, the Chow Chow and the Rottweiler both have similarly blocky heads and it's very possible that Letzty's mother was the Chow Chow mix and passed on a fairly blocky head to Letzty.

Going back to the picture of Scott and Fuller's research, the Basenji and Cocker Spaniel's offspring express the dominant short hair coat from the Basenji, the dominant drop ears from the Cocker Spaniel and the dominant piebald patterning and black pigment from both breeds! For your consideration, you can watch an illustrative video that provides more educational information regarding canine DNA and recessive/dominant traits: <http://youtu.be/UAcPOch4-C8>.

In conclusion, Letzty is a beautiful, unique and one-of-a-kind lovable little girl and looks to be in a very happy home! The game of genetic Plinko (think Price is Right) is a very fascinating world and the combination of different genes makes for very unique, mixed breed dogs! Thank you for taking the time to listen to my explanation as I know it was lengthy; I sincerely hope it addressed your concerns and helped to answer any questions you may have had! However, if you have any additional questions or would like further explanation, please do not hesitate to contact us at customercare@marsveterinary.com or call 888-K9 PET TEST (1-888-597-3883).

Best regards,

Jason

Mars Veterinary

Customer Care Department

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----- Original Message -----

From: Geoffrey Marsh [gdotmarsh@gmail.com]

Sent: 2/12/2014 8:40 AM