



DNA INTRODUCTION

By Shonda Nelson, ApHC Registrar

4.2008

DNA testing (genotyping) began to phase out blood typing almost 15 years ago. In 1997, the ApHC began offering its customers the choice of blood typing or DNA testing with strong emphasis on the necessity of DNA typing. More recent changes in the industry led to the ApHC being forced to make a quick change to eliminate blood typing and only allow DNA testing.

The equine industry as a whole and the Registry in particular is satisfied that DNA technology meets and exceeds the level of integrity that members demand. DNA technology is proven and effective with an efficacy rate of 99.99 percent when using 16 DNA markers. The official laboratory of the ApHC uses 11 additional tests to resolve problems.

In an effort to curtail the possibility of future registration difficulties, we encourage Appaloosa owners to take DNA samples from all breeding horses. Even when, according to current ApHC rules, a DNA type is not required for a certain-aged dam, we still encourage you to take a hair sample, label it with her name and registration number and keep it on file in a dry, paper envelope in case it is needed in the future.

Retrieving usable DNA testing material is inexpensive and simple. The most important thing to remember is that the hairs must be pulled out by the root. They cannot be cut. The root follicles contain the actual DNA material the laboratory uses in the testing procedure. Equine roots are less bulbous than human hair and may be difficult to discern without the assistance of a magnifying glass. Equine roots usually have a slight *hook* on the end.

The most effective way to obtain a usable sample is to separate approximately 10 hairs from the horse's mane, above the withers. Wrap the hairs around your finger and give a quick pull straight up from the horse's body. Pulling straight up usually ensures that the hairs don't break off above the root. You'll have to repeat this process five times until you have approximately 50 hairs. Pulling this small amount won't leave a hole in the mane, even on a horse with a thin mane.

Hair-pulling tips

To be sure you obtain an optimum-quality hair sample, follow these simple steps:



1. Separate a few strands (10 - 20) from your Appaloosa's mane close to its body



2. Wrap the strands around your index and second fingers or around a comb to ensure that you have a firm grip. Pull straight up, quickly and firmly.



3. Pulled hairs should have bulb-shaped roots attached. Steps one and two can be repeated to obtain an adequate sample of about 50 hairs, then knot together.



4. Place the knotted hair sample on the DNA kit with the roots in the places indicated by drawings. Tape the sample to the area indicated. Mail the sample to Maxxam in the pre-addressed envelope enclosed with your kit.

By following the simple instructions printed on the kit -- placing the roots in the area indicated, taping the hair shaft to the kit where indicated, folding any long hairs into the kit, and placing the kit in the included, pre-addressed envelope -- your sample should arrive safely at Maxxam Analytics, Inc., the official laboratory of the ApHC. For more information about Maxxam Analytics, Inc., visit their web site at <http://www.maxxam.ca/>. DNA samples should not be submitted to the ApHC.

To order a DNA testing kit, simply [click here](#). To order a DNA and HYPP combination testing kit, simply [click here](#). Or, contact the ApHC at 208-882-5578 ext. 300. Each kit is horse-specific and great care should be taken to use the proper kit on the proper horse. Also, care should be taken not to accidentally mix hairs from two horses in one kit. Doing so will necessitate re-sampling.

With a 99.99 percent efficacy rate, DNA testing is as close to perfect as you can currently get. However, there are misconceptions about what these tests can and cannot do.

- DNA testing doesn't measure an Appaloosa's purity.

- A foal's DNA cannot name its sire or dam. It can only verify or exclude a foal as the offspring of its stated parents.

DNA is a molecule of heredity. The DNA from the sample of the horse that is being tested comes half from the sire and half from the dam. To parentage verify, the laboratory determines whether the two parents that have been identified as the sire and dam could combine to produce the foal.

- A test for Hyperkalemic Periodic Paralysis, (HYPP) can be completed using the same sample submitted for DNA typing. HYPP is a muscular disease caused by a hereditary genetic defect that leads to uncontrolled muscle twitching or profound muscle weakness, and in severe cases may lead to collapse and/or death. According to research, this condition exists in certain descendants of the stallion Impressive, AQHA registration number 0767246. The ApHC recommends testing to confirm the presence or absence of this gene.

2008 ApHC DNA-Related Rules

1. All stallions by submission of their stallion breeding report for any breeding year must be DNA tested and the results must be filed with the ApHC.

a. Under a grandfather clause, stallions 10 years old or older as of January 1, 1990, and breeding five (5) mares or less need not be typed unless they are breeding by artificial insemination, then the ApHC must have the stallion's DNA on file.

2. All foals are eligible to be parentage verified and all other horses are eligible to be identified through DNA testing on the basis of written analysis filed with the ApHC from an ApHC-approved laboratory, using ApHC- approved testing procedures. Upon necessary filings, such foal's Certificate of Registration shall be issued or re-issued with the designation as "Parentage Verified." In the event any foal is designated as "Parentage Verified," no other method of identification is required under these rules. In the event any other horse is identified through DNA analysis filed with the ApHC, no other method of identification is required under these rules. Test results for genetic conditions, if such test(s) is/are drawn from a DNA sample that is also parentage verified, may be filed with the ApHC and such test results may be designated on the horse's Certificate of Registration. All fees and procedures for issuance of duplicate certificates will be required where applicable.

3. Any horse for which a Performance Permit is sought must be parentage verified through DNA analysis by an ApHC-approved laboratory as required by ApHC rules.

4. If a mare is exposed to two or more stallions in less than 45 days, a DNA test of the stallions, mare and resulting foal will be required before the resulting foal can be registered, with the owners paying the cost of the testing. If the correct sire cannot be determined as a result of the testing, the name of each stallion must be given as the sire of any resulting foals and a breeder's certificate shall be supplied with respect to the services of each stallion. The charge for testing will be the actual and necessary cost for performing each test.

5. If a mare is bred naturally and by transported semen within 45 days, resulting foals will be required to be parentage verified through DNA testing prior to being registered.

6. The ApHC registrar is authorized to randomly and/or selectively require parentage verification through DNA and/or other genetic testing of ApHC-registered horses.

7. In addition to other ApHC registration rules, a foal born in a year shown below is not registerable unless the dam of said foal, born during or after the year shown in the column next to said foal's birth year, has filed with the ApHC the results of said mare's DNA testing from an ApHC-approved laboratory using ApHC-approved testing procedures.

Foal's Birth Year	Mare's Birth Year
2004	1995 and after
2005	1994
2006	1993
2007	1992
2008	1991
2009	1990 and prior years

8. The owner of any horse, for which application is made for registration and which cannot be parentage verified due to unavailability of DNA type of sire or dam, shall have the right to make written request that the ApHC Registrar consider allowing use of alternative verification method(s), and the ApHC Registrar, in the Registrar's sole discretion, may determine that use of alternative verification method(s) are acceptable to the ApHC in the registration of any such horse.