



Spring!



Feature Photo!!



Hanna Montana 2012
Hay Springs Yaks

Please don't forget to send your photos for inclusion in the Feature Photo Gallery!

Send to:

unadtaylor@gmail.com

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A note from the president...

One of the stated Values of the **USYAKS** Association promises that we will work toward preserving the diversity and purity of yaks through science. Our Association has taken that promise seriously. To preserve diversity we've built computer tools, available to all members on the website, that can be used to help avoid inbreeding. Since **USYAKS** was founded, we've tried to preserve purity by using the GeneSeek DNA test to estimate cattle gene introgression. On the basis of the results of that test, we have established a cut-off line to be used to classify yaks and hybrids.

The Board of Directors will be considering a proposal of the Science Committee at the next Board meeting on April 6, 2022. The proposal regards a revision of the DNA standard for the cut-off line between yaks and hybrids. If you would like to offer input or listen to the discussion, please attend; your presence and participation is welcome.

USYAKS was founded almost simultaneously with the initiation of the GeneSeek DNA test. At that time, only a few yaks had been tested at GeneSeek. The Science Committee set the cut-off line at 95%. If your animal had at least 95% yak alleles on the GeneSeek test, it was classified as a "full-blood" yak, otherwise it was classified as a hybrid. The Science Committee understood that as more information was gathered, it was likely that the DNA standard would need to be revised. We've now registered more than 800 yaks, and the Science Committee believes that it now has the data to suggest a revision.

The historical note which is also included in this Newsletter, explains how domestic yaks were developed by Tibetan herdsman, thousands of years ago, by hybridizing their *Bos indicus* cattle with wild yaks. Consequently, all domestic yaks have some cattle alleles in their genome. Recent hybrids show a great many more cattle alleles in their genome than are shown by the yaks that grew out of hybridization thousands of years ago.

The Science Committee believes that their proposed new cut-off is sufficiently flexible to never deny "full-blood" status to a yak whose hybridization took place long ago. The Science Committee also believes that the proposal is restrictive enough to keep our promise to maintain the purity of the yaks in our registry, and discourage future hybridization.

I've attached the proposal below. The proposal will not change the registration status of any yaks already registered. If approved by the Board of Directors, it would set a new standard at about the 97% level, and ignore mitochondrial DNA. The new standard would take effect at a future time to be determined by the Board.



Proposed cut-off line to be used to classify yaks and hybrids

# of calls = %	# total alleles	# max cattle alleles max 3%	# min yak alleles min 97%
87 = 100%	174	5 2.9%	169 97.1%
86 = 99%	172	5 2.9%	167 97.1%
85 = 98%	170	5 2.9%	165 97.1%
84 = 97%	168	5 3%	163 97.0%
83 = 95%	166	5 3%	161 97.0%
82 = 94%	164	5 3%	159 97.0%
81 = 93% (failed call rate)	162	N/A	N/A

The Early Years: How Yaks Came to North America

Tim Hardy



in which he assigned the name *Bos grunniens* to a single yak species.

It took more than 100 years for westerners to understand that the domestic yaks identified by Linnaeus were sufficiently different from their yak ancestors to necessitate the classification of two species of yaks. The differentiation between the two varieties was described by Nikolay Mikhaylovich Przhevalsky, a Russian Imperial Geographer who travelled extensively on the Tibetan plateau.

In 1883, Przhevalsky published “*Iz Zaisana cherez Khami v Tibet i na verkhov'ia Zheltoi reiki*” where he recorded his travels and documented the differences between the domestic yaks and their wild yak ancestors. He assigned the name *Bos mutus* to the wild yaks of the Tibetan plateau. *Bos mutus* is normally translated as the “mute ox”. Przhevalsky assigned this name because he incorrectly believed that wild yaks are mute.



Until about 3000 years ago, there were no domesticated Yaks.

Yaks were a wild bovine living high on the Himalayan plateau.

In their native habitat domesticated yaks are extremely varied in their color patterns. When yaks were brought to Europe, many of the various color patterns came with them. But that’s not true in North America, where there is only a little color variation in coat patterning. In North America, there is a dominant gene for a black nose as well as a variation in the KIT gene that produces our royals and trims. But that’s it: solid, trim, royal, imperial. I’d like to share with you how that came about.

Thousands of years ago yaks roamed the Tibetan plateau just like buffalo did on the North American plains. People began encroaching on the yak habitat bringing their *Bos indicus* cattle with them. There were a lot of yaks and only a few people. Consequently, the yaks and the cattle came into regular contact, and nature took its course. The resulting hybrids offered Tibetan herdsman greater size, tremendous fiber, and greater resilience to the elements. The herdsman recognized these advantages and (mitochondrial DNA evidence suggests) facilitated this hybridization by encouraging the wild yak bulls to breed with their increasingly yak-like hybrids. As well, herdsman likely would have eaten the meanest offspring in their herds, starting with the biggest ones.

This process of developing a domesticated yak involved the selection, by humans, of desirable features present in the wild yaks while also selecting in favor of manageability. The net result seems to have been a manageable smaller version of the wild yaks.

This sequence of events would have happened multiple times in multiple locations throughout the range of the wild yaks. All of this happened over a number of years, with most estimates indicating this occurred about 3000 to 5000 years ago, making yaks the last bovine to be domesticated.

There were some inadvertent consequences of this sequence of events. Cattle had a lot of color variation; yaks were solid brownish black with gray noses. Domestic yaks had a lot of color variation – all of the colors of the cattle, while some continued to exhibit the wild yak coloration.

In the 1700s, Europeans who had encountered yaks on the Himalayan plateau got the attention of one of the world’s foremost naturalists – Sweden’s Carl Linnaeus. In 1766, Linnaeus published “*Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio duodecima, reformata. Holmiae, Impensis*”



The yak species that had been named *Bos grunniens* by Linnaeus, became the domestic yak species. *Bos grunniens* is normally translated as the “grunting ox”.

At the time of Linnaeus and Przewalsky, there was no international body that assigned or approved species names. The International Code of Zoological Nomenclature was established in 1895. At that time the International Commission for Zoological Nomenclature was also established to resolve disputes regarding the naming of species according to that code. It wasn't until 2003 that the ICZN actually addressed the naming of yaks and approved the names given by Linnaeus and Przewalsky.

Przewalsky may have identified wild yaks as a species distinct from domestic yaks in 1883, but not everyone got the memo. In fact, the 1911 Encyclopedia Britannica still referred to both species of yaks as *Bos grunniens*.

Western Europeans had begun importing domestic yaks in the 1700s. There are records of yaks being imported to Great Britain and France. Those yak herds grew beyond the capacity of their importers to contain and feed them and were distributed to zoos and eventually into the private hands of yak brokers. Yaks imported to Europe, were imported before Przewalsky's naming of wild yaks. European imports displayed many of the domestic variations in yak coloration patterns from their native habitat.

There was a period of confusion among zoologists following Przewalsky's publication. There wasn't any DNA analysis to straighten things out and, in fact, even the science of heredity was in its infancy. Gregor Mendel's experiment with peas was not independently verified until 1900. There was a transatlantic

telegraph cable, but most practical transoceanic communication took months. The distinction between the two yak species was not clearly understood or even universally accepted. American and European zoologists following Przewalsky believed that there was a distinction between wild and domestic yaks, but their understanding was necessarily limited.

North American zoologists began importing yaks from Europe in about 1900, precisely during the period when the zoological community was confused about what constituted a “wild yak” and what constituted a “domestic yak”, and whether the differences were enough to constitute two species. The zoologists at the time seemed to universally understand that a wild yak was a bovine with a solid coat color, and the coat color of domestic yaks was varied.

North American zoologists wanted “real” yaks, so they focused on what they called “wild yaks”. They thumbed their noses at the yaks that exhibited varied coloration and focused their attention on yaks with a solid coat color. Most yaks, probably fewer than 100, were purchased from European brokers and brought to North America during a period of about 25 years beginning in the 1890s. The newspaper articles that I've located that address coloration, all refer to imports of yaks with a solid coat color with either a black nose or a gray nose.

Top right is a photo from the Bronx Zoo of two recently acquired yaks. The photo was taken in 1913. At the time the Bronx Zoo indicated that these were “wild yaks”. The picture portrays a bull with a black nose, proving that these were actually domestic yaks.



So where did the North American royals come from? I have been unable to find any photos of North American royal yaks dating before the 1960s, but did find some photos of trims. The gene that causes the royal coat color pattern is the KIT gene, the same gene that causes the trim coat color pattern.

The photos below show that some yaks with the trim color pattern did slip past the early North American zoologists, but in the 1960s, a small group of royal yaks were imported to Canada from Whipsnade Park, a zoo near London.

It's quite possible that a good share of North America's population of royal yaks is a consequence of this 1960's import from Whipsnade.



Updates and Reminders!

Invictus Informatics Awarded Grant to Aid USYAKS Registration Process

Ted Kalbfleisch's company, Invictus Informatics analyzes USYAK's genetic data generated by GeneSeek. *Invictus* was recently notified that they were awarded a Phase I SBIR grant from the USDA to build a web-based data portal that will make it easier for our registrar to submit data, and generate DNA reports. It is also a first step in a larger effort to move USYAK to genome wide genotypes which will make it possible for yak farmers to understand the genetic basis for the important traits that interest them. After the successful completion of the Phase I work, they will be applying for a Phase II grant in March of 2023.



EHD Vaccine Announcement!!

If you live in a region with EHD and intend to use Medgenelabs' EHD vaccine this year, it might be time to act. EHD season starts in late summer and lasts until the first good freeze in the fall. The vaccine is believed to be very effective for about 6 months, it reaches full effectiveness about one month after it's been given. It is recommended that you not give the vaccine to a pregnant yak sooner than one month before she gives birth. The vaccine has "provisional approval" by the USDA. This means that you must order the vaccine at least one month before you intend to administer it.

Information about EHD is included in the last several Newsletters. If you want a refresher, those Newsletters are available on the website. To request the vaccine, please write to Ashley Petersen: Ashley@Medgenelabs.com or contact her at (605) 692-1268.



Fiber Study continues...send your fiber samples to:

Kat Tylee, 1409 SE Hamilton St., Roseburg, OR, 97470

Questions? Email Kat: littlehawkyarns@gmail.com



Show off your yaks!

Send your photo submissions for inclusion in the newsletter to: unadtaylor@gmail.com



Do your part! Join a committee! Contact information below.

Fiber: Una at: unadtaylor@gmail.com

Marketing: Greg at nct1108@yahoo.com

Meat: Vance at vance@hkyakranch.com

Science: Peter at hackett@hypoxia.net

Exhibitions and Shows: Brad at tci@juno.com



The association is still collecting information to track the birth of abnormal calves. Please continue to report any incidences of abnormalities to USYAKS via this link:

<https://www.usyaks.org/tracking-abnormal-calves/>



The Board of Directors meets *via Zoom* the first Wednesday of each month at 7pm Mountain time. All Association members are welcome to attend these video conference meetings.

The membership elects the Board of Directors, each of whom serve for a term of three years.

The Board of Directors selects its own officers annually.

You can view the list and bios of the Board of Directors here: <https://www.usyaks.org/board>