Fjord foal measurements as predictors of adult height

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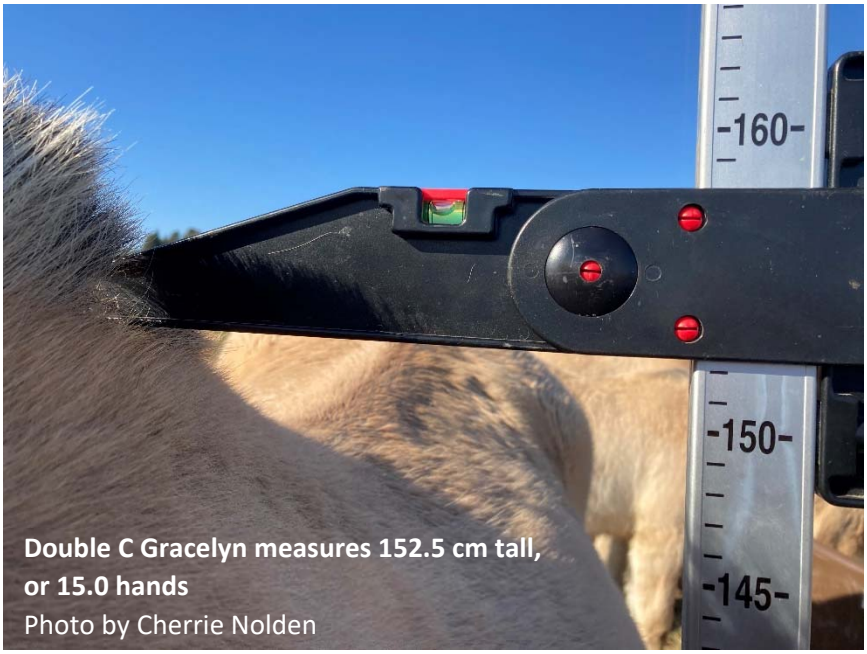

Double C Gracelyn measures 152.5 cm tall, or 15.0 hands
Photo by Cherrie Nolden

The estimation of the final height of a Fjord is always of interest to buyers and sellers of young Fjords. From my personal research, I've concluded that the often-cited estimation tools that have been bantered around social media and popular magazine articles aren't very accurate for Fjords.

The most commonly quoted horse height estimation measurement is from an article in Progressive Cattleman magazine [1]. The author, Stew Nelson, measured cannon bone length of adult and young Quarter Horses (QH) over a few years to develop a prediction of adult height. Logically, this can be a reliable estimate because foals are born with cannon bones that are nearly their final length, and those bones are finished growing by 18 months of age in most horses [2]. Nelson concluded that a straight line measurement from the hairline of the coronet band to the joint at the center of the knee in a 3 month old weanling or older foal corresponds in inches to the mature horse's height in hands. So a 14.75" cannon bone length measurement in a weanling would predict a 14.3 hand final adult horse height.

There are at least 3 points missing when people cite this measurement and height prediction approach:
1) Nelson also wrote that there is a range of ¾" around that estimate,
2) the measured horses were in the 14.1-15.3 hand height range, and
3) the estimate was produced for QHs.
Let's explore those points further as they relate to Fjords:

1) The plus and minus range of ¾" may seem small until one considers the prediction estimation that it produces. A 14.75" cannon measurement in a QH has an accuracy range of 14.0" to 15.5", or 14.0 hands to 15.2 hands. This would be equivalent to a 14.25" Fjord cannon measurement producing a 14.1 hand predicted height, and having a range of 13.2 hands to 15.0 hands. That's not a very good adult height accuracy level for Fjords since that more than covers the Standard range for the Fjord breed. Buyers and sellers of Fjords would like a much tighter, smaller predictive range, such as plus or minus ¼".

2) The Fjord Standard calls for a horse in the 13.1 to 14.3 hand range [2]. This is shorter than the range of QHs that were measured for producing this height estimation tool. It's very likely that shorter or taller breed averages have different ranges of body measurements.

Straight-line measurement from center of knee to hairline of the coronet band
Photo by Cherrie Nolden

3) Quarter Horses are much more highly line-bred than Fjords; it's not uncommon to see a sire or dam repeated multiple times in the tiers of the pedigree in QHs, while repeated parents are not allowed in the first three levels of the pedigree of Fjords. The practice of line-breeding, as is done in QHs, produces consistency of offspring traits in that breed, and my experience with producing over 75 Fjords during the last 30 years is that there is not a lot of consistency between full or partial sibling Fjords due to the low level of line-breeding. This should result in a greater variation range in measurements of the cannon bone length and its relationship to adult Fjord height.

To assess this, I measured all of our adult Fjords to assess what the relationship of cannon length to adult height is, and to create a small sample predictive range for Fjords, as was done for QHs. Of our 14 full-grown Fjords, 5 are taller than the QH cannon bone measurement would predict, and 2 are shorter. Only 50% of our adult Fjords have heights that fall within the QH prediction range. That ¾" QH prediction range needs to be expanded to 1 ¾" shorter and 1" taller than the cannon bone measurement in inches, in order to encompass the variation measured in our herd of Fjords.

To apply this Fjord-specific range, if a Fjord foal's cannon length measured 13.75" then adding the ranges seen in my herd would produce an adult size prediction between 12.0 hands and 14.3 hands (13.75 - 1.75 = 12.0, and 13.75 + 1 = 14.75). That's not very helpful to a prospective buyer. It's just too large of a range to mean anything.

Straight-line measurement from center of knee to hairline of the coronet band. This horse is 15 hands tall
Photo by Cherrie Nolden

I don't see a consistent pattern of height among relatives, or body types in our herd either. Our taller Fjords, which are around 15 hands, are generally taller than the QH cannon bone measurement range would predict. Full siblings Ragnvald and Balijord aren't consistent relative to the QH prediction; Balijord is taller than her cannon bone length would predict, and Ragnvald is within the prediction range of the QHs. Our herd matriarch Alma, and her downline of mares in the herd are all taller than the QH cannon length prediction range would predict. Our drafty type Fjords range from shorter to taller than the Quarter Horse prediction range. Our lighter type Fjords tend to be within or taller than the Quarter Horse height prediction range. Our medium type Fjords are all within the QH range prediction.

The actual range for the Fjord breed is likely even larger than what I measured from our herd, since the sample size of our herd is small compared to the population of Fjords in the USA and around the world. The population range will be at least as large as what I measured.

Gracelyn measures 22 cm from ground to ergot, and 90 cm to her elbow
Photo by Cherrie Nolden

Another suggested estimate of adult height comes from Kentucky Equine Research [4]. "With the foal standing evenly balanced on a solid surface, measure the distance from the ground to the foal's elbow (the leg joint just in front of the girth area). Doubling this measurement will give a hint of the eventual distance from the ground to the withers." The concept behind this approach is that the horse's leg length is equal to the body depth at maturity, and foal leg length is very close to adult length at birth.

I tested this theory in our herd of Fjords. I measured all of the leg lengths of all of our Fjords and compared that measurement to the height. Fjord legs are 5-10% longer than the body depth in our adults, so doubling the leg length isn't an accurate description of the full height.

Here's an example. Our 15 hand (152.5 cm) mare Gracelyn measures 90 cm from ground to her point of elbow. Doubling that number predicts that she should measure 180 cm tall (17.3 hands). This is way off, with the predicted height being far too tall, due to the leg length of Fjords not being comparable to the leg length of the horses that made up the Kentucky Equine Research dataset.

Another variation that I've seen on the Kentucky Equine Research suggestion is to measure a newborn foal's ergot to elbow and double that to predict adult height. When tested in our herd of Fjords, this

approach was also not accurate. As an example, Gracelyn measures 22 cm from ground to ergot, and 90 cm from ground to point of elbow. Subtracting those numbers gives the Ergot-Elbow length of 68 cm. Doubling that length predicts that Gracelyn should be 136 cm tall (13.2+ hands). Since she is 15 hands, that approach doesn't predict accurately. Ingunn is a 2020 daughter of Gracelyn and our 15 hand stallion Elko, so we would expect her to mature in the 15 hand range also. Ingunn's Elbow-Ergot measurement is 62 cm and doubling that would predict a final height of 124 cm (12.1 hands). This is ridiculously short as a prediction of final height in a Fjord born to two 15 hand parents. Even adding a hand (4") to that height is not sufficient to be a close estimate. Ingunn's two older full sisters in our herd are well on their way to maturing around 15 hands, so I am pretty confident that Ingunn will be significantly taller than 12-13 hands.

Ingunn measures 18 cm from ground to ergot, and 80 cm to her elbow
Photo by Cherrie Nolden

So, how can we more accurately guess at final Fjord heights? Are there other tools or approaches?

Consideration of the heights of the parents, and how prior offspring of those parent horses have matured is a better way to guess at the final height of a young Fjord than cannon length or leg length. Breeding consistently like to like will generally make for offspring with more similarities to their parents; if both parents are tall and from tall grandparents, the foal is more likely to be tall, and if both parents are short from a short upline, we should expect similar height foals. When the parent horses are very different in height the foal could be any height, or if the grandparents of a similar-height pair were very different in height it's very hard to guess the mature height of the foal. Tall mares will typically produce tall foals at birth, but the genetic height will prevail at maturity for the foal [5]. If there is a trend seen in a particular line, like the daughters, granddaughters and great-granddaughters of Alma in our herd, that is helpful in predicting that foals from those horses would mature similarly. Many Fjords don't have that many offspring to use as a comparison, so figuring some height in the common range will likely be the mature height is a safe bet.

In summary, given the low level of line-breeding in Fjords, we can expect inconsistency in offspring traits and a very low-reliability prediction of adult height when measuring young Fjord cannon bone lengths. From our personal herd, the prediction that covers the variation is the cannon length in inches +1" and -1.75". That is too large of a range to be useful. Foal leg length in Fjords, and variations such as Elbow-Ergot length, cannot reliably be doubled as a predictor of adult height either. The best predictor is the nearest related group of Fjords and their heights.

References:

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