

# A Statistical Study of Inspection Records

By Nancy R. Skakel

Recently I have been studying the Registrar's records of purebred Shagyas that have been inspected for breeding evaluation by NASS. I transcribed to a spreadsheet all the recorded measurements for height (both in hands and centimeters,) band height, the difference between band height and stick height, cannon measurements, and total average scores from the inspection record, for a total of 171 horses. Sadly, some of those records are incomplete or not recorded at all. Of particular note is the lack of the measurements or total scores for several of the original foundation mares and stallions. I eliminated the records of horses that were presented for evaluation only since those individuals were generally much younger than the rest of the recorded horses, and therefore their measurements would not fit the standard for a physically mature horse. I also eliminated from the stallion records one stallion that was not approved for Shagya breeding. Two horses that were exported without NASS evaluations were also eliminated from the data for the sake of calculating averages. When only partial records were provided, I included the data I had on that horse in the categories for which I had information, but in the categories for which I had no information I eliminated them from the totals for calculating averages. One horse's measurements were recorded only in inches, so I converted those to centimeters to conform with the other horses' records

I determined a base number of horses for each of the above mentioned categories of measurements and scores. I selected and sorted the entire list by sex, creating separate lists for "All Inspected Shagyas: 148," "All Stallions: 33," "All Mares: 96," "All Geldings: 16," and "All Breeding Horses: 129." The last list included all stallions and mares. I then sub-divided all those lists for domestically bred horses (119) and imported horses (33). I established the largest and lowest measurements in each category to find the range. I then totaled all the measurements in a given list category and divided by the number of individuals recorded there to find the average in each category.

I discovered many interesting things in this study. The top 10 Total Average Scores from were all above 8.0. One imported mare had the highest score by a wide margin, 8.66. This was \*85 O'Bajan XIII bred at Babolna and originally imported by Temple Farms. Two stallions, 6 other mares, and 1 gelding are also in that Top 10 scoring group. Applying the same Top 10 criteria to the Breeding Horses only, we see \*85 O'Bajan XIII as the top scorer, with another mare in second, followed by 2 stallions, 6 mares, and another stallion.

Looking at the "All Stallions" list the range of Total Scores is 8.5 to 6.37 for the horse that was not approved for breeding. Six stallions have scores of 8.0 or higher, including one imported stallion. Eliminating the one unapproved horse gives an average score of 7.61. The average cannon measurement is 19.49 cm. with a range from 18 cm. to 20.5 cm. Average height is 155.27 cm. (a hair over

15.1 – more about this factor later), ranging from 160 cm (15.3 h) to 149 (14.3 h). By selecting out the imported stallions we find out of 6 recorded (sadly the scores on 3 imported foundation sires are not recorded) the high score is 8.25, ranging down to 7.16. The measurements for imported stallions and domestically bred stallions (numbering 24) are very comparable. I believe this speaks well for the quality of our stallions overall, and especially for our domestically bred stallions since one assumes that people are paying the expense to import higher quality stallions. Two domestic stallions have been gelded after siring some foals, and one after leaving frozen semen for breeding.

One thing that becomes immediately apparent in studying this record is the variation in the conversion of centimeters to hands of height. For instance, 159 cm. is variously recorded as 15.3 hands or 15.2 ½ hands. I would propose that in the future we have a standardized reference chart for the use of the judges to record their official measurements, and avoid these discrepancies. One also has to wonder about the accuracy of recording measurements such as 154.4 cm for height. A tenth of a centimeter would be difficult to determine. We also see a cannon measurement of 19.8 cm. while all other cannon measurements are stated in quarter centimeter increments rather than tenth centimeters. Again, I think a policy of standardization should be considered.

Our precious mares have impressive scores. The Top 10 mares all scored above 8.0. In fact, there are a total of 15 mares with scores of 8.0 or above. Four of those Top 10 were imported, with a fifth import in the top 15. That is 15.625% of our mares with scores of 8.0 or higher. Only 12 mares scored below 7.0, or 12.5% (one out of eight). 153.77 cm (~15.0 1/2h) is the average height. Cannon measurements are perhaps a shade on the light side at an average of 18.76, but really quite acceptable. The median is 19 cm. I did not have the information to be able to sort horses by the percentage of Arabian ancestry. It would be interesting to see if there is a correlation. At least one imported mare (whose ancestry is unknown to me) had a cannon of only 17 cm.

The statistics on the geldings really surprised me. Since only 2 imported geldings have been inspected, I did not work up a separate chart on them. However, 9 of the Top 10 scoring geldings are domestically bred. We have some exceptionally good geldings out there. The top total score is 8.25! It might be that people are presenting the better quality geldings for inspection, since so few are recorded. High cannon measurement is 20.75 cm, with one individual reaching 172 cm (17 hands) in height. Average score is 7.6, and average height is 156.3 cm (~15.1 ¾ hands).

Not surprisingly band height shows the greatest variation of all measurements, from 202 cm to 144 cm, a difference of nearly 23 inches. Stick height is measured by standing the horse up on a flat, solid surface with their weight evenly distributed on all four feet. A stick with a bubble level is used to measure the height at the withers. The band height is measured with a tape from the ground, along the curvature of the barrel, to the withers. This gives an

indication of the depth of the body, and ideally should be at least 30 cm greater than the stick height. We record differences between stick height and band height in a range of 43 cm to 13 cm. One can imagine that many factors can influence this measurement, such as the age of the horse, their condition (fat or thin), fitness, current pregnancy, or number of prior pregnancies. I can remember one stallion that was probably 200 pounds over weight at his inspection and indeed, he has an exceptionally high band measurement. The mare with the 13 cm is half Arabian and very young. The average band difference for stallions is 26.65 cm, and for mares it is 28.72 cm. Again, the variation between domestic and imported horses is negligible.

I had the individual scores and measurements for all of the horses on the 2006 tour, so I was able to compare the marks for type, head, neck, body, etc. The most outstanding bit of information from this study is that the scores for legs were consistently lower than in any other category. Marks of 6 and 7 were the most common, (average was 6.625) with only one horse receiving an 8 on his legs, and three horses receiving scores of 5 on their legs. Reading the abbreviated judges comments published in the "NASS News" the explanation for many of these low scores had to do with offset cannons, light bone structure, joints too fine, and long cannons. This is an area that we need to pay particular attention to in our breeding choices. Of the 13 horses with leg scores of 5 or 6, over half were out of Arabian (4) or part Shagya-Arabian (3) dams. Another 11 horses with scores of 7 on their legs also had dams that are Arabian or part Shagya-Arabian. This indicates both the value of selection in the Arab outcross and just plain luck in how the genes sort themselves out.

I am really pleased with the general quality that these statistics indicate. It seems to me that we can see the need to pay particular attention to improving bone, correctness, and overall size and substance. It is really quite interesting to note that there does not appear to be a direct relationship between height or cannon measurement and total inspection score, except very generally. In other words, the taller horses tend to have greater band measurements and bigger cannon measurements, although many of the shorter horse have equal or greater cannon and band measurements. Of the 25 horses scoring 8.0 or above, cannon measurements range from 17.75 to 21 cm. Height ranges from 152 (15 hands, the exceptional mare \*85 O'Bajan XIII), to a gelding at 172 cm (17 hands). Several dams of multiple approved stallions had very modest total scores of 6.9 or 7.16. I believe this tells us to use these statistics as useful tools, but we must not lose sight of our personal evaluation of the individual horse in front of us. Not every characteristic is quantifiable or measurable. The judges only get a brief few minutes on one day to score a horse, while the owner lives with the horse and can develop an appreciation and knowledge of that horse's potential contribution. That is why we study pedigrees, to give us a better idea of genotype as well as phenotype.

I recorded the sire and dam of the horses in this study when I could, however for 74 horses (over 43%) I did not have that information. I will continue to work on this database, and expand on the information included. I would like to do a spreadsheet including all the marks given at inspection, for type, conformation, and gaits. As I said above, it would be interesting to compare horses factored with the percentage of Arabian ancestry to see how that influences size, bone, and type. I have a new found respect for statisticians. I have never had any training in this work. Even with this relatively small database, keeping the numbers all straight and in agreement took me many hours of work. I triple checked all data entry, but I cannot guarantee that there are no errors. I did my best. I will report back in the future when I have more information to share.

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