Réseau laitier canadien
Canadian Dairy Network

Final Score for Conformation: Relating Bull Proofs to Daughter Performance

This article is the second in a series that will focus on the relationship between a bull's proof and the expected average performance of his daughters.

Holstein Canada classifiers provide type classification services to close to 9,000 herds during each 7-month round which translates to over 14,000 herd visits and 170,000 animal classifications each year. The classification details for each animal, combined with pedigree information, provide the basis for the calculation of bull proofs and cow indexes for a total of 24 descriptive traits, 7 major scorecard traits plus overall Conformation, which is based on each animal's Final Score.

Genetic evaluations for each type trait are calculated using advanced scientific methods based on sound genetic principles which account for the major environmental factors including the age at calving, the stage of lactation at classification and the average level of the herd for each type trait. Resulting genetic evaluations are expressed on a scale with zero equal to breed average and values ranging from approximately –15 to +15. Although this expression of bull proofs easily identifies the breed leaders for various traits, as well as the relative strengths and weaknesses of each bull, there is no clear association between a bull's type proof and the expected classification that a future daughter would receive. A recent study at Canadian Dairy Network (CDN) was aimed to establish this association as a tool for assisting producers in the proper understanding and interpretation of Canadian type proofs.

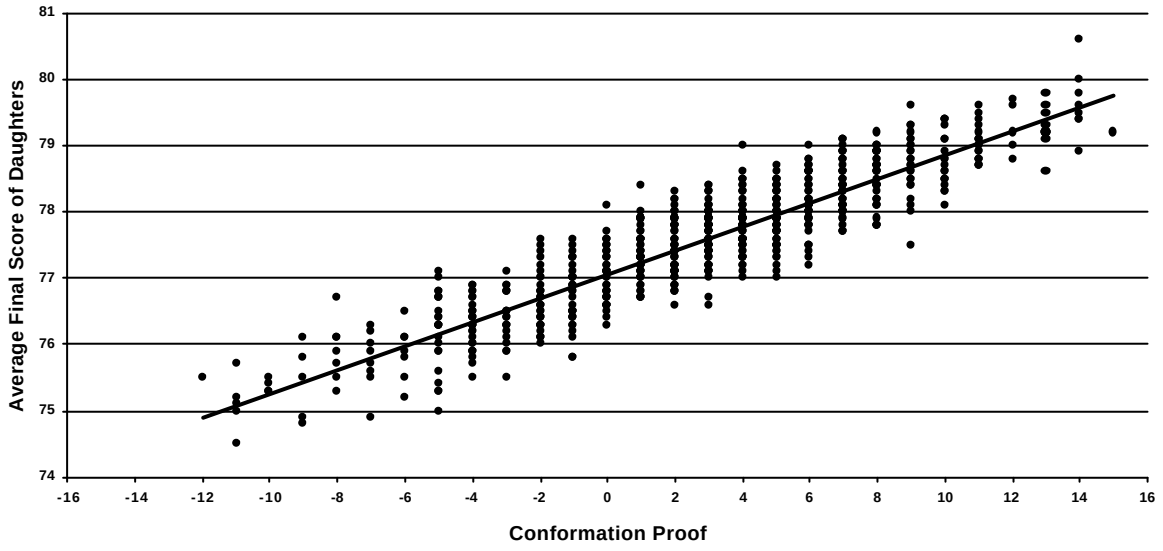
Bulls Analyzed

Canadian bull proofs for type traits are based solely on the first classification of each daughter in first lactation. Cow indexes do incorporate later reclassifications as they advance in age but reclassifications in the upward direction only have been shown to bias resulting bull proofs. In order to establish an accurate, up-to-date relationship between a bull's proof for Conformation and the average Final Score of their daughters, only proven bulls born since 1994 that have at least 50 classified daughters in their proof were analyzed. These 777 bulls represented newly proven young sires during the past three years and averaged 75 daughters classified in first lactation. In total, 0.49% were Very Good at their first classification in first lactation while 39.29% were Good Plus, 46.37% were Good, 12.18% were Fair and 1.67% were classified Poor.

Conformation Proof and Average Final Score

Figure 1 shows the relationship between bull proofs for Conformation and the actual average Final Score of their daughters at their first classification in first lactation. The solid dark line represents the average relationship across all bulls in the study and it is obvious that there are relatively few bulls that stray from this general association. Basically, this graphs indicates that a bull with a Conformation proof of zero today would be expected to have an average daughter Final Score of 77 points. For every one point difference in a bull's Conformation proof from "0", the average Final Score of their daughters is expected to change by .18 points compared to 77 points. For example, a bull at +10 for Conformation is expected to have an average daughter Final Score of +1.8 points (ie: +10 x .18 = +1.8) higher than the 77-point average, therefore 78.8 points. The same type of calculation can be done for any proof, whether it be negative or at the top of the breed near +15, which results in an average Final Score of 79.7 points.

Figure 1: Relationship Between Conformation Proof and Average Daughter Final Score at their First Classification in First Lactation

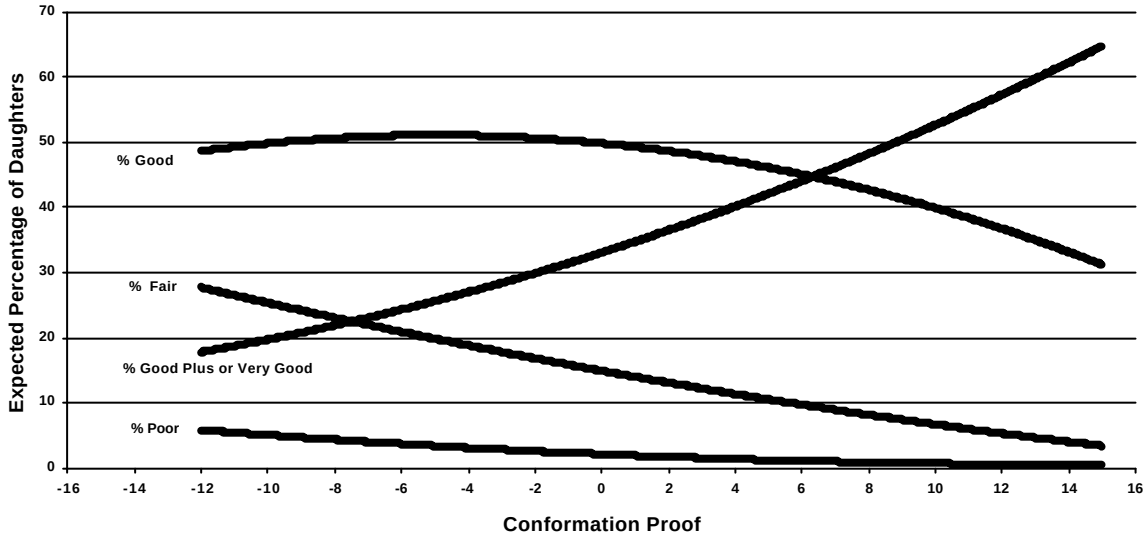


Expected Distribution of Daughters

Another way to interpret type proofs would be to evaluate the possibility of getting a daughter which scores Good Plus or better at their first classification in first lactation. Figure 2 helps understand these probabilities visually by indicating the expected percentage of daughters in each Final Class category according to the bull's proof for Conformation. Due to the extremely low percentage of animals scoring Very Good at their first classification in first lactation, a single line is used to represent the percentage of daughters classifying Good Plus or Very Good. From Figure 2 it can be seen that bulls with below average Conformation proofs have more daughters scoring Fair and

fewer at Good Plus. These bulls tend to have close to 50% of their daughters classifying Good. As the Conformation proof increases above +6, the expected percentage of Good Plus or Very Good daughters surpasses that of Good daughters while the probability of a Fair or Poor daughter at their first classification drops below 10%. It should be noted that these expected percentages assume a bull is mated at random to breed average cows but if a bull's mates are consistently genetically above average for type, then the probability of Good Plus or Very Good daughters would be higher than presented in Figure 2 but the bull's Conformation proof would be adjusted for the genetic superiority of his mates.

Figure 2: Relationship Between Conformation Proof and the Expected Percentage of First Lactation Daughters in Each Final Class Category



Later Classifications

This study concentrated on the relationship between bull proofs for Conformation and the average Final Score of their daughters' first classification in first lactation. Although the association between these two is quite clear in Figures 1 and 2, it was not possible to examine the relationship between Conformation proofs and the distribution of daughter classifications based on all reclassifications during their lifetime. It is obvious, however, that high Conformation bulls producing more daughters scoring Good Plus or Very Good as 2-year-olds, should end up also with more older daughters scoring Very Good or Excellent, compared to lower Conformation bulls.