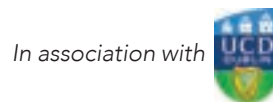


Racetrack opportunity and success – the ‘Speed Gene’ test



A collaborative research study between UCD and global equine science company, Plusvital, led to an investigation into the economic outcome when thoroughbred horses are run over optimal or sub-optimal distances as defined by the ‘Speed Gene’ test. This article provides an overview of the investigation

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Traditional methods such as pedigree and conformation inform the perceived optimal distance for a horse. However, the Speed Gene test assesses genetic variation at the myostatin gene (Rooney et al, 2017), enabling a highly accurate prediction of a horse’s optimal race distance: C:C=short; C:T=middle; and T:T=long (Hill et al, 2019).

METHODS

UK and Irish racing form for 49,000 horses for 38,000 turf flat races (UK & Ireland, 2010-2017) was used. Over 20,000 samples were genotyped for the Speed Gene (Hill et al, 2010). N=1,707 unique horses were matched to race records. Year of birth ranged from 2001-2015; 88% were born after 2007. The sample was gender-balanced. Horses were trained by 354 individual trainers and the progeny of 276 distinct sires. Race distances were grouped into ‘distance bins’ (Figures 1 and 2). The number of times each horse ran in each distance bin and prize money earned by each horse in each distance bin was calculated. The data was split by Speed Gene type (ie. C:C, C:T, T:T) and also into two-year-old (2yo) race season, three-year-old (3yo) race season and total career. A performance index was calculated as (% prize money/% runners) -1.

RESULTS

Horses overperformed in their predicted distance ranges and underperformed in distance ranges for which they are not genetically suited (Figures 1 and 2). Furthermore, performance among all Speed Gene types consistently deteriorated as the race distance diverged from the predicted optimal distance.

C:C horses represented 71% of 3yo runners in 5-6furlong (f) races. These horses won 89% of available prize-money, representing a relative overperformance of 25%. By contrast, 28% of the runners at this distance were C:T, with C:T horses winning just 11% of the prize-money available, a relative

underperformance of 61%. In the 2-year-old (yo) season, a large proportion of C:T and T:T horses were entered into shorter races but underperformed with respect to potential earnings. As 3yos, there was a tendency for C:C and C:T horses to be entered in longer races for which they were unsuited.

DISCUSSION

In the largest study to date, there was a clear relationship between Speed Gene type and earnings by distance. A random sampling of horses at each distance would be expected to win the equivalent percentage of available prize-money. However, C:C horses

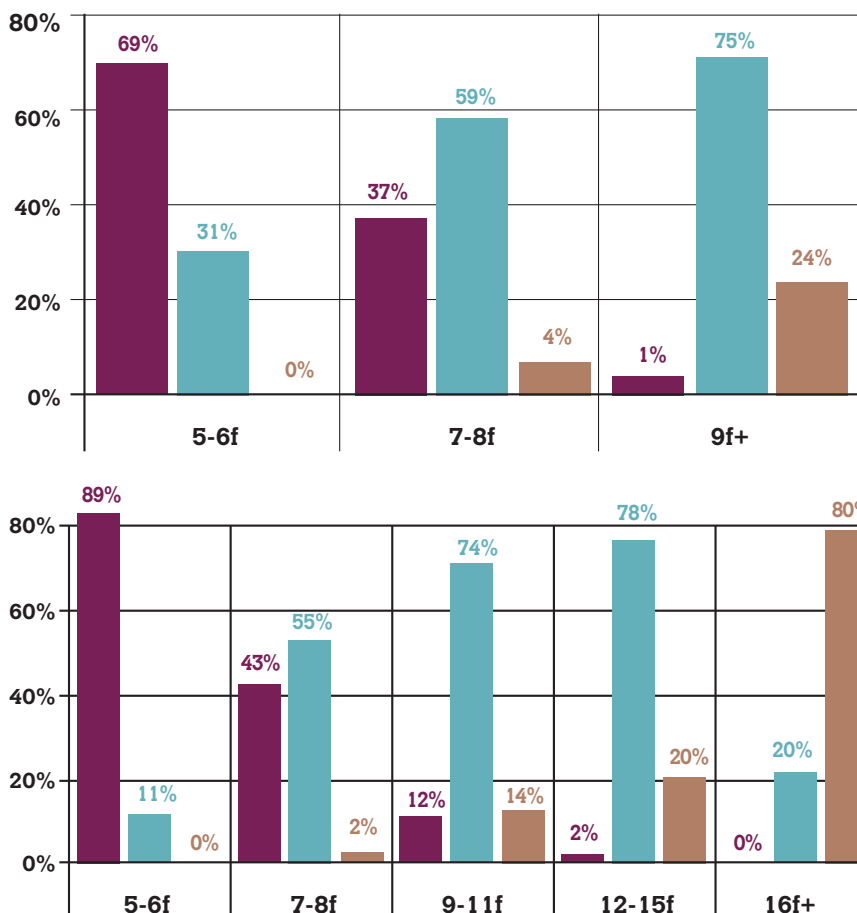


Figure 1: % prize money won. C:C (purple), C:T (blue), T:T (brown). 2yo (top) and 3yo (bottom).

disproportionately outperformed in terms of prize-money in races <1 mile (8f), C:T horses outperformed in 9-15f races and T:T horses excelled in longer distance races. There was a large proportion of instances where horses were consistently tried over a sub-optimal distance. As well as the economic impact, this could have negative implications for horse welfare.

CONCLUSION

The Speed Gene test predicts the race distance range for an individual horse that offers the best opportunity to maximise earnings potential. Augmenting traditional methods with evidence-based scientific data will improve

economic returns on investments in horses-in-training. The key value of the Speed Gene test is that it provides a means to accurately predict a horse's optimal race distance as soon as the foal is born, independent of age or training status. This enables optimised training and race planning resulting in economic benefits for owners and trainers and improved horse management and welfare.

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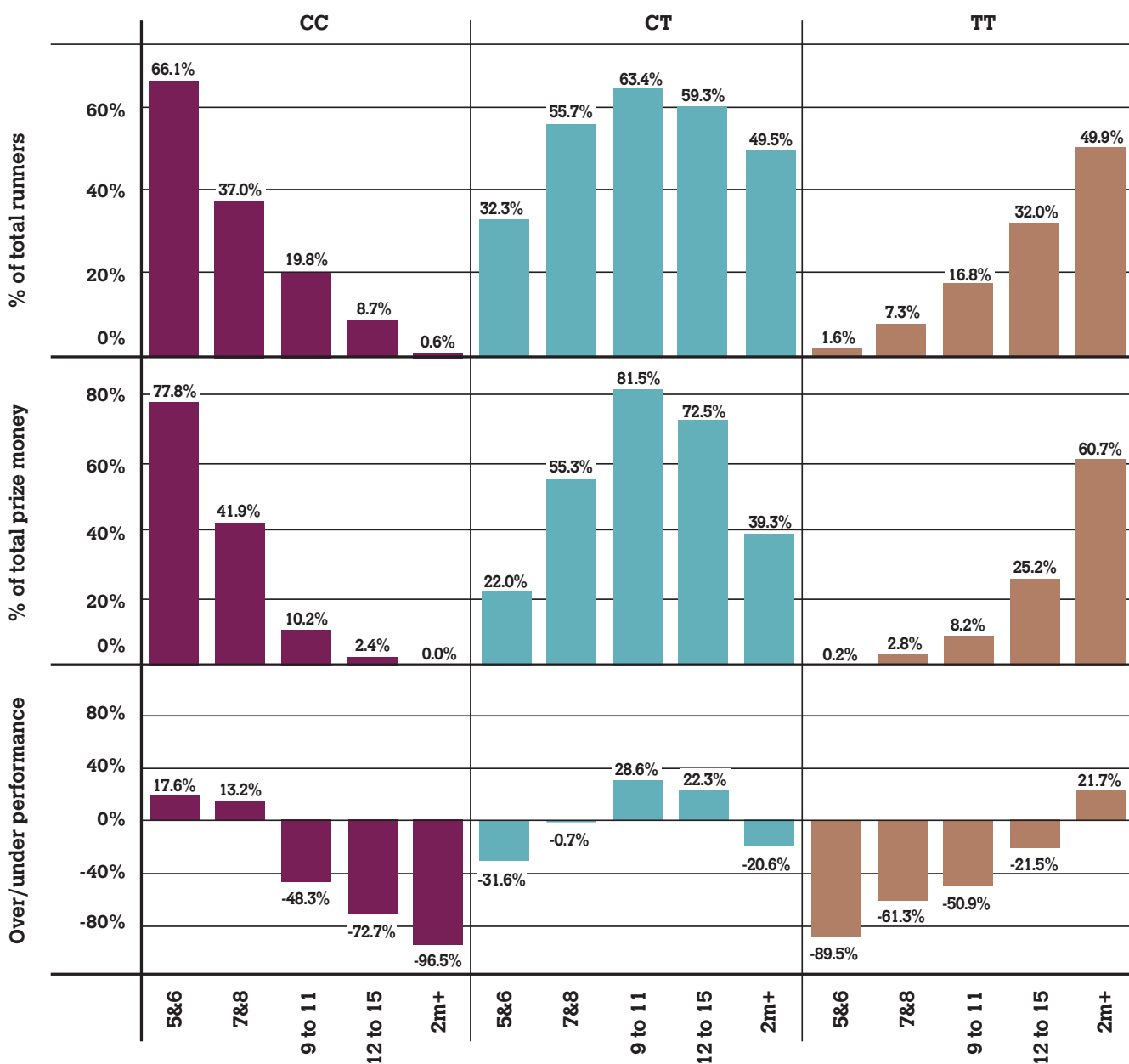


Figure 2: Total career performance index. Race distances are in furlongs (except 2m+ = 2 miles plus).

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