Factors affecting racecourse performance in National Hunt racehorses

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Introduction

- Exercise regimes affect performance in flat racehorses (Verheyen et al., in press) but no studies have investigated factors affecting performance in horses that race over hurdles or steeplechase fences (National Hunt [NH] horses).

- NH races are longer than flat races and horses must negotiate obstacles. Therefore, training regimens will need to reflect this.

Hypotheses

- **Odds of winning, winning prize money or being 'pulled up' in a race will be affected by canter, gallop and race distances accumulated in the 30 days* prior to the race.**

- **Odds of falling or unseating the rider in a race will be higher in horses that have not jump schooled in the 30 days* prior to the race.**

Materials and Methods

- Daily exercise records and horse data were collected from horses at 14 UK NH yards between October 2003 an April 2005 (included 2 racing seasons).

- Race data for the study period were collected retrospectively.

- Mixed effects logistic regression was used to investigate effects of horse- and race-level variables and exercise accumulated in the 30 days preceding the case race on the following binary outcomes:

  - 'win' – whether the horse won.
  - 'prize money' – whether the horse won any prize money.
  - 'pulled-up' – whether the horse was stopped by the jockey during the race.
  - 'fell' – whether the horse fell or unseated the jockey in the race .

- Horse was included as a random effect and the level of statistical significance was set at $p=0.05$.

Results

- Data from 4,442 races by 858 horses were included in the study.

- 693 (16%) races were won, prize money was won in 2,319 (52%) races, horses were pulled-up in 457 (10%) races and fell/unseated the jockey in 259 (6%) races.

Odds of winning a race were affected by:

- **Canter distance accumulated in the previous 30 days** ($p=0.002$) (Figure 1).
- **Race distance accumulated in the previous 30 days** (OR=1.01/f, 95% CI: 1.00-1.02, $p=0.03$) [range= 5-36f].
- **Horse age** (OR=0.88/year, 95%CI: 0.84-0.93, $p<0.001$) [range = 3-14 years].
- **Number of runners in the case race** (OR=0.09/ln(runner), 95%CI: 0.07-0.11, $p<0.001$).
- **Trainer** ($p<0.001$).

Results

Odds of winning prize money were affected by:

- **Canter distance accumulated in the previous 30 days** ($p=0.004$) (Figure 1).
- **Gallop distance accumulated in the previous 30 days** ($p=0.03$) (Figure 2).
- **Horse age** (OR=0.90/year, 95%CI: 0.86-0.95, $p>0.001$).
- **Number of runners in the case race** (OR=0.09/ln(runner), 95%CI: 0.07-0.11, $p<0.001$).
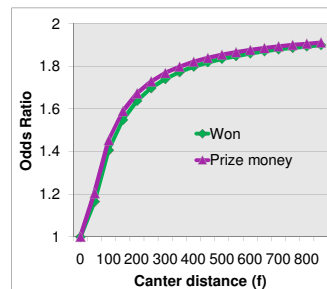- **Trainer** ($p<0.001$).

Figure 1: Effect of cumulative canter distance in the previous 30 days on odds of winning and winning prize money in a race
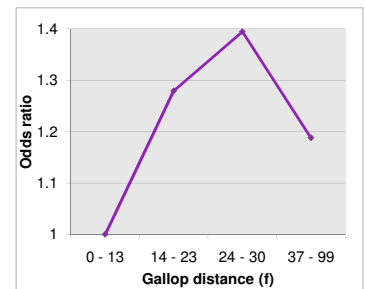

Figure 2: Effect of cumulative gallop distance in the previous 30 days on odds of winning prize money in a race

Odds of being pulled-up were affected by:

- **Canter distance accumulated in the previous 30 days** (OR=0.998/f, 95%CI: 0.997-1.00, $p=0.01$).
- **Case race distance** (OR=1.20/f, 95%CI: 1.11-1.20, $p<0.001$) .
- **Number of runners in the case race** ($p=0.001$) (Figure 3).
- **'Type' of case-race** (steeplechase vs. hurdle race) (OR=1.5, 95%CI: 1.12-1.99, $p=0.01$).
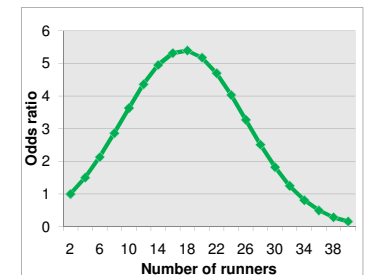- **Trainer** ($p=0.002$).

Figure 3: Effect of number of runners on odds of being pulled-up in a race

Odds of falling/unseating the rider in a race were affected by:

- **Jump schooling** in the previous 30 days (vs. no jump schooling) (OR = 1.5, 95%CI: 1.14-2.13, $p=0.01$).
- **'Type' of case race** (steeplechase vs. hurdle race) (OR=3.40, 95%CI: 2.50-4.57, $p<0.001$).

Conclusions

- **The likelihood of winning, winning prize money or being pulled-up in a race was associated with exercise distances accumulated in the previous 30 days.**

- **Jump schooling was associated with increased odds of falling in a race, but this may be because horses known to be "poor jumpers" were more likely to be schooled before a race.**

Reference: Verheyen, KLP, Price, JS and Wood, JLN. Exercise during training is associated with racing performance in Thoroughbreds. Veterinary Journal, *in press*.