

PURPOSE

To investigate differences in shooting performance and performance related factors between the **HOLD** and the **TIMING** strategy in biathlon standing shooting.

METHODS

- Shooting performance and aiming point trajectory were measured from each shot in 23 biathletes at REST and in RACE (Figure 1).
- Based on the mean distance-time profile of the aiming point, approach velocity (AV) was calculated for each biathlete (Figure 2).
- 10 biathletes with the lowest AV in REST were categorized as **HOLD** and 10 biathletes with the highest AV in REST as **TIMING**.



Figure 1. Test protocol.

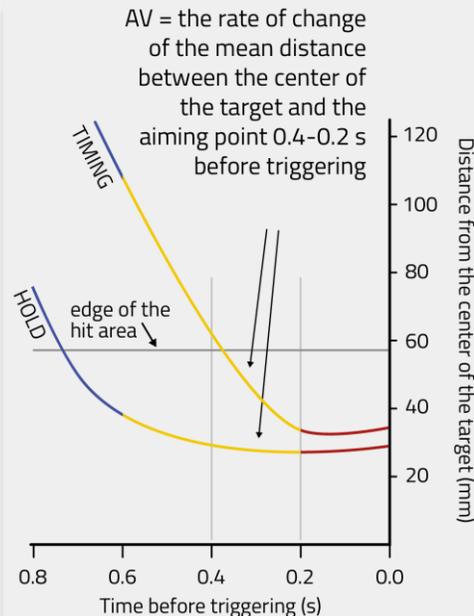


Figure 2. Distance-time profiles.

AIMING STRATEGY AFFECTS PERFORMANCE RELATED FACTORS IN BIATHLON STANDING SHOOTING

Köykkä M¹, Ihalainen S², Linnamo V¹, Ruotsalainen K¹, Häkkinen K¹, Laaksonen MS³

¹Faculty of Sport and Health Sciences, University of Jyväskylä, Jyväskylä, Finland
²KIHU – Research Institute for Olympic Sports, Jyväskylä, Finland
³Swedish Winter Sports Research Centre, Department of Health Sciences, Mid Sweden University, Östersund, Sweden

RESULTS

Both groups demonstrated similar shooting performance both at REST and in RACE.

In **HOLD**, better shooting performance was related to higher holding time (**HT**)
 REST $r=-0.88$, $p=0.001$
 RACE $r=-0.73$, $p=0.016$
 higher aiming accuracy (**COG**)
 REST $r=0.93$, $p<0.001$
 RACE $r=0.72$, $p=0.018$ (Figure 3).

In **TIMING**, better shooting performance was related to lower mean velocity (**MV**)
 REST $r=0.77$, $p=0.009$
 RACE $r=0.88$, $p=0.001$
 lower absolute triggering value (**ATV**)
 REST $r=0.82$, $p=0.003$
 RACE $r=0.72$, $p=0.012$ (Figure 3).

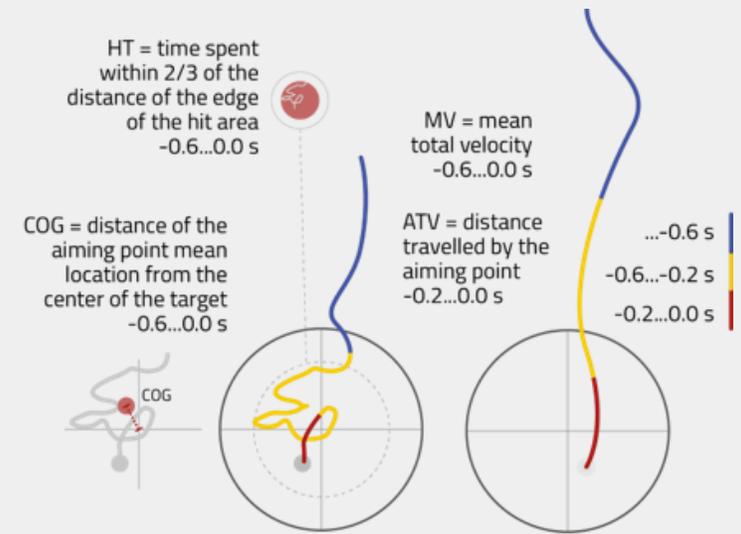


Figure 3. Performance related factors.

CONCLUSIONS

- Biathletes using **HOLD** should focus on their aiming accuracy and holding ability.
- Biathletes using **TIMING** should focus on their ability to approach the target straightforwardly at a controlled velocity and the ability to minimize the movement of the aiming point during the triggering phase.

PRACTICAL APPLICATIONS

- Biathletes and coaches should be aware of the strategy in use and plan the shooting technical exercises accordingly.
- Despite their faster approach, also timing shooters should decrease aiming point velocity before triggering.