



TRUSTRENGTH DYNAMOMETER

THE CALF TESTING SOLUTION

THE IMPORTANCE OF CALF ASSESSMENT AND MONITORING

Injuries to the calf complex are common place in field sports, accounting for up to 13% of injuries in soccer at 0.32 p/1000hr of exposure ¹.

Feasible and reliable protocols for determining maximal and rapid force generation using force plate assessments are established ²; however, the practical utility of the TruStrength dynamometer means this protocol can be replicated across performance and/or clinical environments.

As strength and symmetry are key to keeping athletes on the field, regular assessment and monitoring of calf strength is essential to inform performance and mitigate injury risk.

The Hawkin team advises several reliable calf testing protocols, giving coaches and clinicians confidence in their calf strength assessments.

Although the TruStrength device can be used to assess calf force capabilities using a variety of protocols, our team recommends the following tests, which are described in this guide:

→ ***Kneeling Calf Test***

→ ***Seated Calf Test***

KNEELING CALF TEST

Equipment checklist

- ✓ TruStrength
- ✓ Multiplanar Clamp Mount or Pivot
- ✓ Large Paddle x1
- ✓ Gym Rack (not provided)

TEST SETUP INSTRUCTIONS

The kneeling calf test involves the athlete kneeling with their involved limb with a diagonally orientated shin (with slight ankle plantar-flexion [up to 20°]), horizontal thigh (90° hip flexion) with arms placed across the chest to limit extraneous movement ³. The non-involved limb is placed posteriorly, with knee on the floor.

The TruStrength is attached to the multiplanar clamp mount with the large paddle attachment placed on the anterior thigh, proximally to the patella, to “jam” the athlete between the TruStrength and the floor. The athlete then pushes into the TruStrength device maximally (typically for 3 or 5 seconds-maximum).

This kneeling isometric calf testing protocol enables practitioners to obtain quality insights into calf force production with a soleus bias, without having to find a box, bench, or chair that would permit each individual athlete’s tested limb’s thigh to be horizontal. Therefore, this calf test is quick to perform and is also guaranteed to ensure the tested limb’s thigh is positioned horizontally due the test position being tailored to each individual’s anthropometrics.



SEATED CALF TEST

TEST SETUP INSTRUCTIONS

The seated isometric calf test is an established protocol used in both sport ⁴ and clinical settings. The tested limb is placed with a diagonally orientated shin (with slight ankle plantar-flexion [up to 20°]), horizontal thigh (90° hip flexion), and with arms placed across the chest to limit extraneous movement. The non-tested limb is placed on the floor in a 90° hip, knee, and ankle position to support weight bearing.

Being able to apply this protocol with the TruStrength unilaterally (versus the conventional bilateral version of this test) removes the confounding variable of bilateral strength deficit, where the sum force of both limbs contracting simultaneously is lower when compared to the sum of unilateral force capability ⁵.

Equipment checklist

- ✓ TruStrength
- ✓ Multiplanar Clamp Mount or Pivot
- ✓ Box/Bench (not provided)
- ✓ Large Paddle x1
- ✓ Gym Rack (not provided)

For populations where weight bearing in a kneeling position presents a challenge, the seated isometric calf protocol enables practitioners to obtain quality insights into calf force production with a soleus bias (a tip is to sit the athlete on a box, bench or chair that permits the tested limb's thigh to be horizontal, which is sometimes easier said than done).



DATA & METRICS

Every TruStrength test is processed the same way, every time. Removing human error and inconsistency ensure results reflect real changes, not differences in how the data was handled.

PEAK NET FORCE

Peak Net Force provides insight into an athlete's maximal strength. This metric is great to track during mid-stage rehabilitation and/or pre-season, and early in-season.

NET IMPULSE / AVERAGE FORCE

The average force or impulse can give you insight into an athlete's ability to sustain force over the entire contraction duration.

RAPID FORCE / RFD

Net force at 50-200 ms and rate of force development (RFD) during the repetition can give you insight into the athlete's explosive strength capability.

The TruStrength system makes strength testing quick, reliable and repeatable, empowering practitioners with real-time data that supports decision making and elevates client outcomes.

TAG SELECTION

This example represents a tag workflow for the Kneeling Calf test. Accurate tags are essential for insightful data analysis, so you know HOW you tested when it comes to analysis.

TEST NAME: **KNEELING CALF**
TEST LIMB: **RIGHT**



Protocol Considerations

LONGER DURATIONS

10+ seconds

Recommended if
muscle endurance is of
interest

MODERATE DURATIONS

3-5 seconds

Recommended if
maximal strength is of
interest

SHORT DURATIONS

1 second

Recommended if rapid
force expression is of
interest

VERBAL CUES

"fast" and "hard"

Recommended for any
test duration (assuming
uninjured athlete)

*Whether you are profiling, screening or monitoring
your athletes, TruStrength brings precision and
confidence to strength testing.*

Join leading professionals who are using Hawkin data to drive smarter decisions.

ENDNOTES

¹ Ekstrand J, et al. Epidemiology of muscle injuries in professional football (soccer). The American Journal of Sports Medicine. 2011;39(6):1226-1232.

² McMahon, J.J., et al. The kneeling isometric plantar flexor test: preliminary reliability and feasibility in professional youth football. Journal of Functional Morphology and Kinesiology. 2023; 8(4), p.164.

³ McMahon, J.J., et al. The kneeling isometric plantar flexor test: preliminary reliability and feasibility in professional youth football. Journal of Functional Morphology and Kinesiology. 2023; 8(4), p.164.

⁴ Rhodes, D., et al. Test-retest reliability of the isometric soleus strength test in elite male academy footballers. International Journal of Sports Physical Therapy. 2022;17(2), p.286.

⁵ Škarabot, J., et al. Bilateral deficit in maximal force production. European Journal of Applied Physiology. 2016;116(11), pp.2057-2084.