CONCLUSIONS: Although no differences were observed in VGRFpeak and IMPPos was reduced, RFD was significantly greater in the second pull with the DKB. These data suggest that DKB may enhance the training stimulus by enabling the athlete to produce comparable peak forces in shorter time periods by increasing muscular shortening velocity. This may be due to a positional optimization of muscular-length-tension properties in the hip, knee, and ankle extensor musculature uniquely offered by utilizing a DKB technique.

PurPOSE: To investigate central nervous system (CNS) excitability modulation in chronic resistance trained and untrained participants by assessing 1) short intracortical inhibition (SICI) and 2) motor evoked potential (MEP) of the biceps brachii, during different voluntary contraction intensities.

METHODS: 12 participants, 6 untrained (30 ± 1.4 years) and 6 chronic resistance trained (29.6 ± 7.5 years), completed one experimental session within which three blocks of contractions were performed. The block included 10% of MVC, prior to the contractions: 1) elbow flexors MVC, 2) maximal compound muscle action potential (Mmax) in the biceps brachii during a 5% MVC elbow flexion contraction and 3) active motor threshold at the three different contraction intensities were recorded. A total of 60 MEPs, evoked by transcranial magnetic stimulation (TMS), were assessed from biceps brachii muscle of the dominant arm during the three different contraction intensities.

RESULTS: 1) MVC force of the chronic resistance trained group was 33 % higher (p < .001) than the untrained group. 2) The chronic resistance trained group had lower AMTs at all contraction intensities (p ≤ .03, p ≤ .01, p ≤ .08 for the 15, 25 % and 40 % of MVC, respectively) compared to the untrained group. 3) MEP amplitude (normalized to Mmax) did not differ between the two groups. 4) During 25 % of MVC, the untrained group exhibited decreased SICI in comparison to the chronic resistance trained group (SICI: 78 ± 13% vs. 97 ± 9% of test pulse; p ≤ .01, respectively). During 40 % of MVC, the untrained group also exhibited decreased SICI in comparison to the chronic resistance trained group (SICI: 86 ± 14% vs. 102 ± 11% of the test pulse; p ≤ .03, respectively). SICI did not differ between groups at 15 % MVC (p ≤ .30).

CONCLUSION: Based on the results, chronic resistance training significantly reduces SICI at stronger contraction intensities compared to no training. The significant reduction in inhibitory outputs suggest the presence of an adaptive process of facilitatory network activation, which can cancel out the SICI, to increase corticomotor drive to the exercised muscle following a long period of resistance training.

PurPOSE: Examining how knee extensor moments (pKEM) and PF joint reaction forces (PFJRF) and stresses (PFJS) change when squatting to above parallel (AP), parallel (P), and below parallel (BP) depths using HB and LB positions.

METHODS: 20 individuals (sex: 10M/10F; age: 23.0 ± 2.8 years) participated in this study. On day one, a one repetition maximum (1RM) was measured. On day 2 participants performed squats using 70% 1RM to AP, P, and BP depths using both HB and LB. Motion capture and two force plates were used to record whole body kinematics and ground reaction forces, respectively. pKEMs were calculated using inverse dynamics while PFJRF and PFJS were calculated using a model incorporating knee angles, extensor moments, and estimates of PF contact area. Effects of depth and bar position were evaluated using 3x2 repeated measures ANOVAs.

RESULTS: For pKEMs, there was a main effect of depth (p=0.047), with pKEMs being lower at P than either AP (p=0.044) or BP (p=0.030) depths. For PFJRF there was a significant depth by load interaction (p=0.024). For both HB and LB positions, PFJRF was lower at BP compared to the AP (p=0.001) depths. However, when using LB position PFJRF was also lower at P than AP (p=0.001) depth. There were no differences in PFJS between depths (p=0.75) or bar positions (p=0.19).

CONCLUSION: Individuals can squat to parallel or deep depths with their preference of bar position without increasing PFJS or PFJRF. However, squatting to parallel may be preferred as pKEM are lowest at this depth.

PurPOSE: To assess the effects of resistance training on drive distance in female golfers: A Pilot Study

METHODS: Participants were six female athletes (n=6) from a NCAA Division III varsity golf team (19.3 ± 1.4 years). Data was collected before and after an 8-week ST program focused on increasing vertical jump height. Participants completed two 45-minute ST sessions/week under the supervision of a certified strength and conditioning coach. Exercises included squats, broad jumps, box jumps, lunges with and without rotations, and sprints. VGRF was measured on force plates during the downswing phase of the golf swing with a driver and DD was measured with a golf launch monitor. Vertical jump height and measures of lower extremity and core strength were also collected.

RESULTS: The correlation between VGRF and DD was weak (r = 0.03, p = 0.74). There were no significant differences between pre and post VGRF (25.3 N ± 32.8 N; p = 0.12) nor DD (-3.7 m ± 11.6 m; p = 0.47) within subjects.