The hack squat

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The hack squat exercise can be used as a supplementary exercise to squats, during both the off-season and in-season. It can also be used as a supplemental lift for athletes who are unable to do squats.

The hack squat machine exercise can be important to any rehabilitation program. According to Walters, "the importance of the eccentric and concentric contraction in rehabilitation is well-reported in the literature, as vital to the strengthening of muscles. The hack squat machine exercise allows this and is very effective in exercising the lower extremity in a non-weight bearing position (reducing the stress around the knee). ...The hack squat machine exercise is an excellent supplemental lift and can be vital to rehabilitation" (2). For example, if an athlete has a lower back injury and is unable to do squats or leg presses, the angle of the platform and the position of the feet during the hack squat takes the pressure off the lower back and hips, and places it on the lower quadriceps and knee joint (1). During the hack squat machine exercise, no stabilization is required. The exercise involves pushing the weight in an upward motion while controlling the concentric and eccentric contraction. Balancing the weight is not required as it is in the squat. It is well known that the squat is a difficult exercise both mechanically and metabolically. The hack squat machine exercise

Figure 1. Be sure feet are at the top edge of the platform. Toes may extend.
can be extremely important in strengthening the muscles and connective tissues around the knee.

When performing the hack squat machine exercise, it is important to push from the heels to prevent the onset of tendinitis around the patellar tendon. As in the parallel back squat, where you would not want to lean forward, placing the weight on the balls of the feet and stress on the patellar tendon, you would not want to push from the toes during the performance of the hack squat. To avoid this problem, it is important to put the feet at the top edge of the platform (Figure 1); you can even let the toes hang off. The feet should be about shoulder-width apart (Figure 2), similar to the front squat, where the stress is placed on the front lower quadriceps (Figure 3).

The primary sports that benefit from the hack squat exercise are football (development of the lower quadriceps and knee stability are vital in front-out sprinting and lateral agility or "cutting"); baseball (specifically, pitchers in their drive off the mound); track (sprinters and hurdlers in coming out of the blocks, stride length, and stride frequency); basketball (in fast explosive movements and any quick change in direction); and soccer. An example of a hack squat program for football is shown in Table 1.

There are several machines on the market; we recommend one in which you can adjust the angle of the lift and the angle of the platform in order to achieve optimum results.

If you cannot purchase a hack squat machine, the exercise can be performed with a barbell. Standing in front of the bar with the heels on a two-inch board (Figure 4), the athlete bends at the knees, taking a shoulder-width grip on the bar; the head is erect, the back is straight and the hips are down. The athlete begins the movement by driving the legs up, pushing down with the heels, and returning to the standing position, holding the barbell behind the thighs (Figure 5). Next, the athlete squats down, bending at the

Figure 2. Feet are shoulder-width apart.

Figure 3. Stress is placed on the front lower quadriceps, as in the front squat.
hips and knees, and returns to the ready position to begin the next repetition.

References

Editor's note: At the time this article was written, Chip Sigmon was strength and conditioning coordinator and Daniel Duncan served as head assistant strength and conditioning coach at Appalachian State University.

Table 1. Hack Squat Program for Football

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<thead>
<tr>
<th>In-season</th>
<th>First workout of the week</th>
<th>Second workout of the week</th>
</tr>
</thead>
<tbody>
<tr>
<td>running backs,</td>
<td>squat or leg press</td>
<td>hack squats and lunges</td>
</tr>
<tr>
<td>defensive backs,</td>
<td>3-5 sets x 3-10 reps</td>
<td>3-5 sets x 8-12 reps</td>
</tr>
<tr>
<td>wide receivers,</td>
<td></td>
<td></td>
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<tr>
<td>and quarterbacks</td>
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<table>
<thead>
<tr>
<th>Off-season</th>
<th>First workout of the week</th>
<th>Second workout of the week</th>
</tr>
</thead>
<tbody>
<tr>
<td>linebackers</td>
<td>back squats and/or leg press</td>
<td>snatch squats and/or hack squats</td>
</tr>
<tr>
<td></td>
<td>3 sets x 5-10 reps</td>
<td></td>
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</table>

Training poundages are heavier during the off-season.

Figure 4. Starting position of the hack squat performed with a barbell.

Figure 5. Standing position of hack squat performed with barbell.
Execution Checklist
Hack Squat

Starting Position

☐ Shoulder-width stance
☐ Place feet at the top edge of an approximately 4" high platform.
☐ Pelvis level and slightly forward of the ankles throughout the execution of the exercise.
☐ Keep torso "tight" throughout the execution of the exercise.
☐ Keep knees in line with the toe position during the descent and ascent.

Descent

☐ Keep low back and abdominals tight.
☐ Inhale at the start of the eccentric contraction.
☐ Control descent velocity to avoid bottoming out.
☐ Pressure on the feet should be on heel to mid-foot.

Ascent

☐ Exhale after the hardest portion of the ascent.
☐ Keep head up and slightly back.
☐ Keep lower back and abdominals tight.
☐ Drive up flat-footed to keep pressure on quads.
☐ Avoid hyperextending the knees during lockout position.

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